VWorks3 software

User Guide

Agilent Technologies

Notices

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Agilent Technologies

Letter to our Customers

Dear Customer,

The Agilent Technologies acquisition of Velocity11 resulted in the following changes:

- Creation of Agilent Technologies Automation Solutions, formerly Velocity11
- Renaming of some Velocity11 products
- New Customer Service and Technical Support contact information
- New website address for product information

Please make a note of the following changes as they impact this user guide.

Velocity11 product name changes

Velocity11 product name	Changes to ...
Access2 Automated Microplate Loader	Automated Centrifuge Loader
Element Automation System	BioCel 900 System
IWorks Device Driver Programming Interface	VWorks Device Driver Interface
PlatePierce Seal Piercing Station	Microplate Seal Piercer
VCode Barcode Print and Apply Station	Microplate Barcode Labeler
Velocity11 Robot	3-Axis Robot
VHooks Integration Interface	VWorks Hooks Interface
VPrep Pipetting System	Vertical Pipetting Station
VSpin Microplate Centrifuge	Microplate Centrifuge
VStack Labware Stacker	Labware Stacker

New contact information

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Web: www.agilent.com/lifesciences/automation

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1 Introduction

This chapter introduces the *VWorks User Guide*.

Before you use VWorks to operate your lab automation system, you need to become familiar with the contents of this guide.

Who should read this guide

Job roles

This user guide is intended to be read by people with the following job roles:

Job role	Responsibilities
Integrator	Someone who writes software and configures hardware controlled by VWorks.
Lab manager, administrator, or technician	Someone who is responsible for: ❑ Developing the applications that are run using VWorks ❑ Solving the more challenging problems that may arise ❑ Developing training materials and standard operating procedures for operators
Operator	Someone who performs the daily production work using VWorks and solves routine problems. Your organization may choose to create its own procedures for operators based on the information in this guide.

About Velocity11 user guides

Introduction

Each Velocity11 user guide is delivered to you as:

- ❑ Online help
- ❑ A PDF file
- ❑ A printed book

The information in each format is the same but each has different strengths. To work most effectively it helps to know when it is best to use each format.

Where to get the online help and PDF

Online help

The VWorks online help file is installed separately from the software, from the VWorks Help CD_ROM. The file that launches the help is called help.html and is located in this folder:

C:VWorks Workspace/docs/helpsystem

PDF file of the user guide

C:VWorks Workspace/docs

The VWorks user manual in PDF format is located on the software CD-ROM, as a file that you need to copy onto your computer. It is not automatically installed with the software.

Note: You can also download the latest version of all the documentation from our website at www.velocity11.com/support/support.html.

Online help

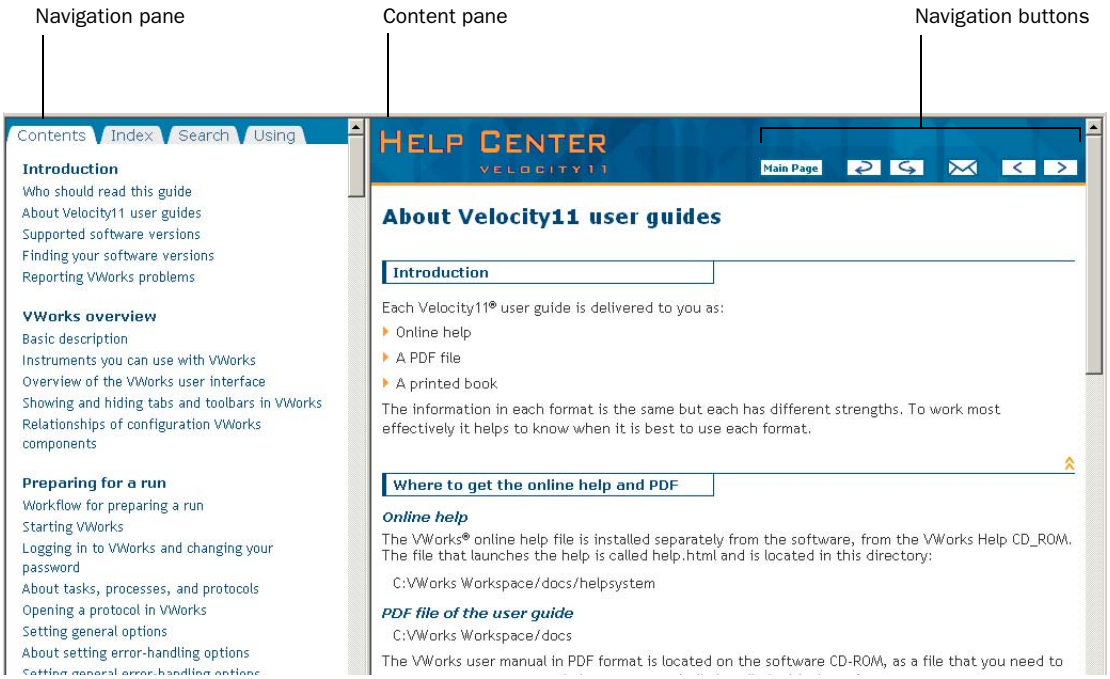
The online help is the best format to use when you are working at the computer and when you want to perform fast or advanced searches for information. It is also the only format in color.

To open the online help:

1. Do one of the following:
   - ◆ Use the shortcut installed to your desktop by the help installation program, or
   - ◆ Open the help from within the VWorks application by clicking the help button.

Main features

The online help includes a navigation pane, content pane, and navigation buttons.


Navigation pane
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Who should read this guide
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Finding your software versions
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Showing and hiding tabs and toolbars in VWorks
Relationships of configuration VWorks components
Preparing for a run
Workflow for preparing a run
Starting VWorks
Logging in to VWorks and changing your password
About tasks, processes, and protocols
Opening a protocol in VWorks
Setting general options
About setting error-handling options
HELP CENTER
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Online help
A PDF file
A printed book
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Where to get the online help and PDF
Online help
The VWorks® online help file is installed separately from the software, from the VWorks Help CD_ROM. The file that launches the help is called help.html and is located in this directory:
C:\VWorks Workspace/docs/helpsystem
PDF file of the user guide
C:\VWorks Workspace/docs
The VWorks user manual in PDF format is located on the software CD-ROM, as a file that you need to

The navigation pane has four tabs. The Contents, Index, and Search tabs provide different ways to locate information. The Using tab contains information about using the help system.

The content pane displays the online help topics.

Navigation buttons in the content pane allow you to navigate through the pages.

PDF user guide

Filename

The VWorks user guide in PDF format is a file named VWorksUserGuide_<*publication_date*>.pdf.

Computer requirements

To open the user guide in PDF format, you need an Acrobat viewer. You can either use the viewer that is built into Adobe Acrobat, or you can download the free Adobe Reader application from http://www.adobe.com/support/downloads/main.html.

We provide user guides in PDF format mainly for printing additional copies. You can use them for simple searches from the Find button, although these searches are much slower than online help searches:

For more information about using PDF documents, see the Adobe Acrobat PDF help system that can be accessed from your Acrobat viewer.

Supported software versions

About this topic

This topic lists the versions of the VWorks software and device drivers that are documented in this guide.

VWorks version

This guide documents VWorks3, file version 20.x.

Device drivers

This guide documents the following device drivers.

Device driver	Version	Device driver	Version
Aliquot Device	2.3	ST6StackerDevice	4.1
BioTekWasherDevice	3.0	StackerDevice	8.4
deviceenumerator.dll	5.0	TeleshakeDevice	2.3
Echo550Device	2.5	TeleshakeHighSpeedDevice	2.3
EnvisionDevice	1.1	UltramarkDevice	3.1
FlexispenseDevice	2.1	V11Labware.dll	12.0
FlexispenseNewDevice	3.0	V11Liquids.dll	5.0
MultidropDevice	3.2	V11Security.dll	3.0
MultiskanAscentDevice	2.0	VCode3KDevice	10.1
NanodropDevice	1.1	ViciValveDevice	4.0
OriginalVCodeDevice	3.2	VLidDevice	1.3
PipettorShakeShelfDevice	2.3	VPrepDevice	17.2
PlateLocDevice	6.2	VSpinAccess2Device	1.1
PlatePierceDevice	4.1	VSpinDevice	4.2
QFillDevice	3.0	WellMateDevice	1.2
RempCSPDevice	2.1	ZeissReaderDevice	2.1

Related information

For information about...	See...
Device drivers that are plug-ins	*Device Driver User Guide*

Finding your software versions

About this topic

This topic shows you some ways to find out your versions of VWorks and VWorks Diagnostics.

From the software

You can open the software to find the version of VWorks or device diagnostics.

To find the VWorks version number:

1. Start VWorks.
2. Navigate to **Help > About VWorks**.

To find the diagnostics version number:

1. Start VWorks.
2. Open diagnostics for the device.
3. Read the version number on the title bar.

From the files

You can look at the version information in the executable files.

To find the VWorks or diagnostics version number:

1. Navigate to C:\VWorks Workspace\bin.
2. Right-click VWorks.exe or <filename>.ocx (a diagnostics file) and select **Properties**.
3. Click the **Version** tab.

Reporting VWorks problems

About this topic

If you find a bug in the software or have a technical or hardware problem that you cannot resolve after reading the chapter on maintenance and troubleshooting, read the information in this topic for how to report problems.

Reporting software problems

If you find a problem in the Velocity11 software, let us know by:

- ❑ Sending a bug report from within VWorks
- ❑ Sending an email to service@velocity11.com or euroservice@velocity11.com
- ❑ Calling the Velocity11 Service Center at 1-800-979-4811 or 1-650-846-6611

Sending files

When resolving software bugs or other problems, we may ask you to send device and protocols files and the Velocity11 registry file from the Windows registry.

Reporting user guide problems

If you find a problem with this user guide or have suggestions for improvement, please take a minute or two to give us your feedback using the feedback button in the online help. Your comments will be reviewed promptly and used to write the next version of the guide.

You can also send an email directly to documentation@velocity11.com.

Related information

For information about...	See...
Sending registry files	“Moving or sending a registry file” on page 372
Reporting a bug	“Sending a bug report” on page 518

2 VWorks overview

This chapter introduces VWorks and its user interface. This chapter also includes a list of devices that are supported by VWorks.

Basic description

About this topic

This topic briefly introduces VWorks.

What is VWorks

VWorks is software that manages and controls lab automation systems. VWorks can control very simple systems, such as a single pipettor that is fed microplates by a human, and it can control complex systems, such as a BioCel, that use a robot to move plates between a dozen or more instruments.

About protocols

Users create and run protocols, which are sequences of tasks. Each task performs an activity, such as moving a microplate to a plate sealer where the plate is sealed.

Because VWorks is a multithreaded application, a single protocol can simultaneously run more than one sequence of tasks.

The dynamic scheduler

A dynamic scheduler analyzes the protocol as it is run and performs the tasks in a manner that uses the instruments simultaneously and most efficiently. This efficiency reduces the overall time of the run.

Protocols are compiled and simulated

Before a protocol is run, a compiler checks it for logical errors that would otherwise prevent the protocol from completing. Users also have the option of running simulations of the protocol before committing expensive samples.

Manual and automatic starts

Protocols can be started one at a time by a user, or started unattended using a timer and a list of protocols. Users can be automatically informed of errors by email or pager.

Real-time manipulation and troubleshooting

VWorks can also manipulate each instrument in the system in real-time by sending individual commands using diagnostics software. This is useful for setting up and troubleshooting.

Comprehensive event logging allows the operator to analyze each run and troubleshoot problems.

Instruments you can use with VWorks

About this topic

This topic lists the instruments that you can use with VWorks.

If there is a product not listed here that you would like to add to your lab automation system, please contact Velocity11 for customization information.

Definition

Instruments are individual pieces of equipment that manipulate microplates. Every instrument is also a device, although not every device is an instrument. For a definition of devices, see "About devices" on page 102.

Velocity11 instruments

The following Velocity11 instruments can be used with VWorks.

Instrument	Description and comments
PlateLoc	Thermal plate sealer
PlatePierce	Seal piercing station
VCode	Bar code print and apply station
VPrep	Pipetting station
VSpin	Microplate centrifuge
VSpin with Access2	Microplate centrifuge and loader
VStack	Labware stacker

Third-party instruments

The following third-party instruments can be used with VWorks.

Instruments	Description and comments
ASYS Hitech GmbH FlexiSpence and FlexiSpense-M	Automated liquid dispenser
Beckman Multimek with or without a Labcon tip loader	Automated pipettor
BioRad Ultramark	Plate reader
Bio-Tek ELx405 Washer	Automated microplate washer
Molecular Devices FLIPR^{TETRA}	Cell-based assay system
Genetix aliQuot	Low volume liquid dispenser

Instruments	Description and comments
Genetix QFill2 Dispenser	Automated liquid dispenser
Innovadyne Nanodrop	Automated liquid pipettor
H+P Labortechnik VARIOMAG Teleshake	Plate shaker
Labcyte Echo 550	Compound reformatter
Liconic STX (StoreX) and STR series	Plate incubators
Matrix Wellmate	Liquid dispenser
Molecular Devices instruments using SoftMax Pro software	Microplate readers
PerkinElmer Envision	Plate reader
PerkinElmer PlateStak	Labware stacker
Remp CSP	Tube sealer
Tecan Systems Cavro Pumps	Syringe pump
Thermo-Electron Multiskan Ascent	Plate reader
Thermo Labsystems Multidrop	Automated microplate filler
Vici Multiport Valves	Valve system
Zeiss plate::vision	Plate reader

Third-party robots

The following third-party robot can be used with VWorks.

Robot	Description and comments
KiNEDx Robot	Plate-handling robot

Human robot

If you do not have a robot, you can operate as the robot. When the protocol runs, dialog boxes appear and direct you to move plates.

The human robot is most useful for protocol development and for carrying out simple protocols with one or two instruments.

Overview of the VWorks user interface

About this topic

This topic introduces the pages, toolbars, and menus that make up the VWorks user interface (UI).

About the VWorks UI

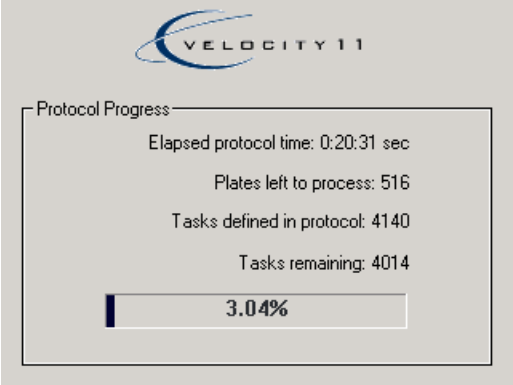
The VWorks UI is made up of tabbed pages, toolbars, and a menu bar.

Tabs

Each of the tabbed pages is described briefly here.

Progress page

The Progress page contains a progress bar that you use to monitor the overall progress of the run.



Pre-Protocol Editor page

The Pre-Protocol Editor page, also known as the pre-protocol editor, is used to create pre-protocol processes.

Pre-protocols are processes that are carried out once before the protocol is executed. Typically, these processes contain:

- Pipette tasks.

  For example, a pre-protocol can be set to prime a pump with fluid before any runs begin

- Place labware tasks.

  For example, to define the labware allowed with a particular device for the current set of runs

- User Messages.

  For example, prompts to empty liquid waste containers and to refill liquid source containers

Protocol Editor page

The Protocol Editor page, also known as the protocol editor, is used to create protocols.

The purpose of VWorks is to run protocols, which are sequences of tasks that determine how the plates are manipulated by the various devices in your lab automation system.

Pipette Process Editor page

The Pipette Process Editor page, also known as the pipette process editor, is used to create pipette tasks that perform liquid handling procedures.

Post-Protocol Editor page

The Post-Protocol Editor page, also known as the post-protocol editor, is used to create post-protocol processes.

Post-protocols are processes that are carried out once after the protocol is executed. Typically, these processes contain pipette tasks. For example, a post-protocol can be set to flush lines with a buffer or cleaning agent at the completion of a protocol.

Device Manager page

The Device Manager page, also known as the device manager, is used to set up and configure the system.

All instruments and robots that are controlled by VWorks must be set up as devices. In addition, labware and liquid classes used by some instruments are configured here.

Toolbars

Each of the toolbars is briefly described here.

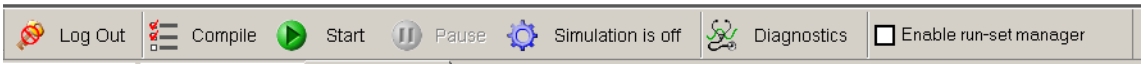
Main toolbar

This is the Main toolbar.

The Main toolbar contains buttons for common commands such as creating new protocol files, copying, cutting, pasting, and printing. You can get information about each button by resting your mouse over it.

Control toolbar

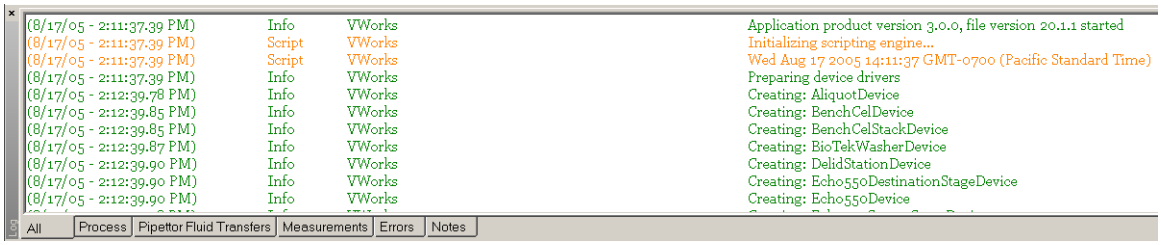
This is the Control toolbar.



The buttons on the Control toolbar have a variety of uses in VWorks and are documented as needed in this guide.

Log toolbar

This is the Log toolbar.


(8/17/05 - 2:11:37.39 PM) Info VWorks Application product version 3.0.0, file version 20.1.1 started
(8/17/05 - 2:11:37.39 PM) Script VWorks Initializing scripting engine...
(8/17/05 - 2:11:37.39 PM) Script VWorks Wed Aug 17 2005 14:11:37 GMT-0700 (Pacific Standard Time)
(8/17/05 - 2:11:37.39 PM) Info VWorks Preparing device drivers
(8/17/05 - 2:12:39.78 PM) Info VWorks Creating: AliquotDevice
(8/17/05 - 2:12:39.85 PM) Info VWorks Creating: BenchCelDevice
(8/17/05 - 2:12:39.85 PM) Info VWorks Creating: BenchCelStackDevice
(8/17/05 - 2:12:39.87 PM) Info VWorks Creating: BioTekWasherDevice
(8/17/05 - 2:12:39.90 PM) Info VWorks Creating: DelidStationDevice
(8/17/05 - 2:12:39.90 PM) Info VWorks Creating: Echo550DestinationStageDevice
(8/17/05 - 2:12:39.90 PM) Info VWorks Creating: Echo550Device
All
Process
Pipettor Fluid Transfers
Measurements
Errors
Notes

The Log toolbar contains six sub-pages. The All sub-page displays the complete log. The other sub-pages display only certain types of log messages, for example, only error messages.

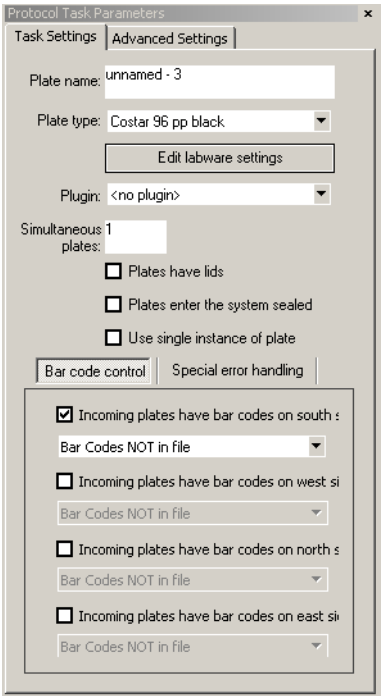
Protocol Tasks toolbar

This is the Protocol Tasks toolbar.

It can only be viewed from the Protocol Editor page. It provides a palette of tasks available for protocols.

Protocol Task Parameters toolbar

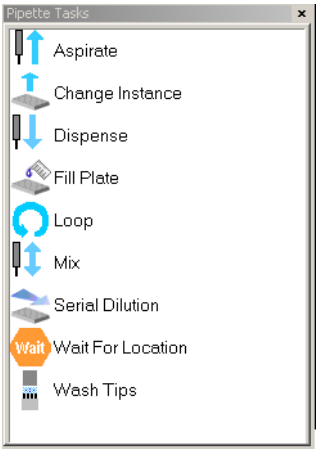
This is the Protocol Task Parameters toolbar.


Protocol Task Parameters
Task Settings
Advanced Settings
Plate name:
unnamed - 3
Plate type:
Costar 96 pp black
Edit labware settings
Plugin:
<no plugin>
Simultaneous plates:
1
Plates have lids
Plates enter the system sealed
Use single instance of plate
Bar code control
Special error handling
Incoming plates have bar codes on south s
Bar Codes NOT in file
Incoming plates have bar codes on west si
Bar Codes NOT in file
Incoming plates have bar codes on north s
Bar Codes NOT in file
Incoming plates have bar codes on east si
Bar Codes NOT in file

The Protocol Task Parameters toolbar can only be viewed from the Protocol Editor page. The fields in this toolbar are specific to the task selected.

Pipette Tasks toolbar

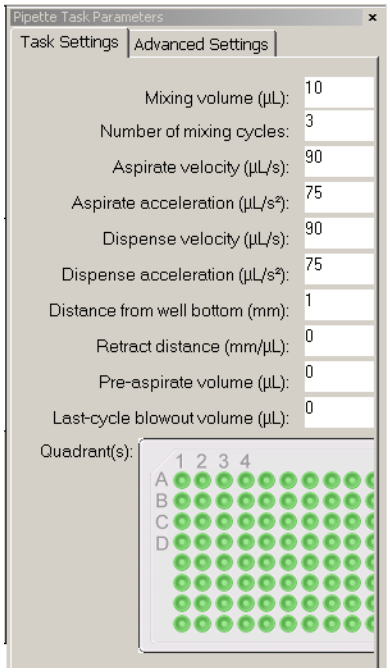
This is the Pipette Tasks toolbar.



The Pipette Tasks toolbar can only be viewed from the Pipette Process Editor page.

Pipette Task Parameters toolbar

This is the Pipette Task Parameters toolbar.



The Pre/Post Protocol Tasks toolbar can only be viewed from the Pipette Process Editor page. The fields in this toolbar are specific to the task selected.

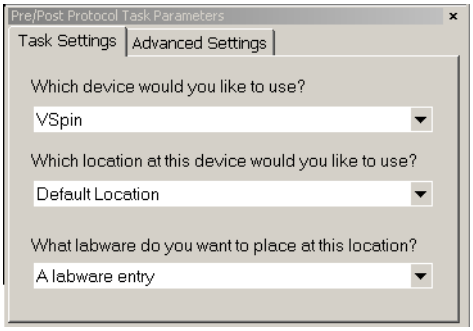
Pre/Post Protocol Tasks toolbar

This is the Pre/Post Protocol Tasks toolbar.

The Pre/Post Protocol Tasks toolbar can be viewed from the Pre-Protocol Editor and the Post-Protocol Editor pages.

Pre/Post Protocol Task Parameters toolbar

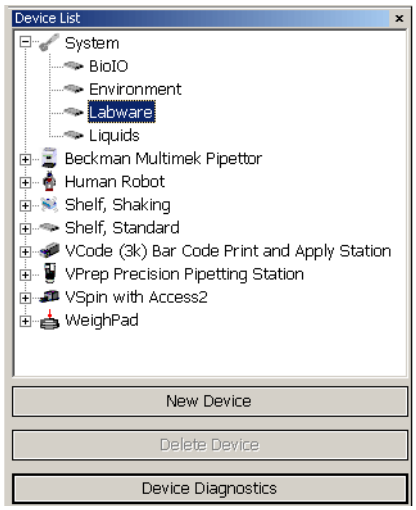
This is the Pre/Post Protocol Task Parameters toolbar.


Pre/Post Protocol Task Parameters
Task Settings
Advanced Settings
Which device would you like to use?
VSpin
Which location at this device would you like to use?
Default Location
What labware do you want to place at this location?
A labware entry

The Pre/Post Protocol Task Parameters toolbar can be viewed from the Pre-Protocol Editor and the Post-Protocol Editor pages.

Device List toolbar

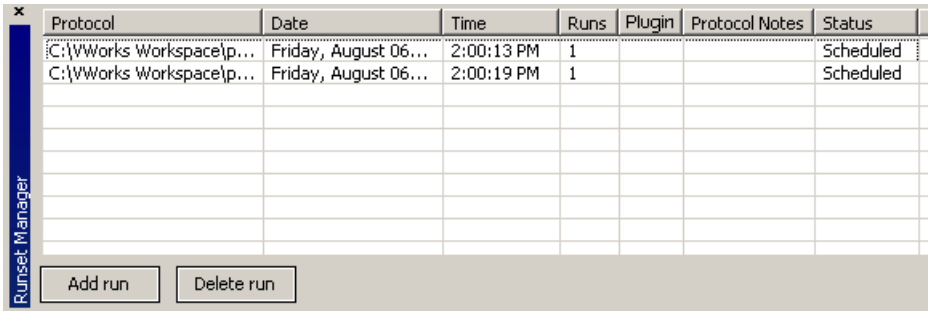
This is the Device List toolbar.



The Device List toolbar can be viewed from the Device Manager page.

Run-Set Manager toolbar

This is the Run-Set Manager toolbar.



The Run-Set Manager toolbar can be viewed from the Progress page.

Menus

Each of the menus is briefly described here.

File menu

The commands on the File menu are used for:

- ❑ Opening, closing, and saving files.
- ❑ Printing.
- ❑ Closing VWorks.

Edit menu

Use this standard menu to cut, copy, paste, and delete tasks in a protocol.

View menu

The commands on the View menu are used to toggle display of the status bar and the various toolbars.

Tools menu

The commands on the Tools menu have a variety of uses in VWorks and are documented as needed in this guide.

Help menu

The commands on the Help menu are used to:

- ❑ Show the versions of VWorks and the various devices supported.
- ❑ Email a bug report to Velocity11.

Related information

For information about...	See...
Starting VWorks	"Starting VWorks" on page 27
Showing and hiding toolbars and tabs	"Showing and hiding tabs and toolbars in VWorks" on page 21
Log toolbar	"Working with the Log toolbar" on page 75
Protocol Task toolbar and the Protocol Task Parameters toolbar	"Creating a protocol: basics" on page 161
Pipette Tasks toolbar and Pipette Task Parameters toolbar (VPrep)	"Setting VPrep pipette task parameters" on page 221
Pipette Tasks toolbar and Pipette Task Parameters toolbar (Multimek)	*Device Driver User Guide*
Pre/Post Protocol toolbar and Pre/Post Protocol Task Parameters toolbar	"Creating a protocol: advanced topics" on page 267
Device List toolbar	❑ "Setting up devices" on page 101 ❑ "Setting liquid-handling definitions" on page 361 ❑ "Setting labware definitions" on page 337
Run-Set Manager toolbar	"Working with the run-set manager" on page 66

Showing and hiding tabs and toolbars in VWorks

About this topic

This topic describes how to show and hide toolbars and tabs on the VWorks user interface.

When you first start VWorks, not all the tabs and toolbars are visible. For example, the tabs Pre-Protocol Editor and Post-Protocol Editor are hidden.

Showing/hiding tabs procedure

To show all tabs:

1. Select **Tools** > **Options**.
2. In the **Protocol Editor Settings** group box, select the **Show Pre/Post Protocol Editor** check box.

   The Pre-Protocol Editor and the Post-Protocol Editor tabs become visible.

To hide the Pre-Protocol Editor and the Post-Protocol Editor tabs:

1. Select **Tools** > **Options**.
2. In the **Protocol Editor Settings** group box, clear the **Show Pre/Post Protocol Editor** check box.

   The Pre-Protocol Editor and the Post-Protocol Editor tabs are now hidden.

Showing/hiding toolbars procedure

To show or hide toolbars:

1. Select **View** > **Toolbars** > ***toolbar name***.

   For example, to show or hide the log toolbar, select **View** > **Toolbars** > **Log**

   Note: Not all toolbars are available for all tabs.

Related information

For information about...	See...
Starting VWorks	"Starting VWorks" on page 27
Tabs, toolbars, and menus on the VWorks user interface	"Overview of the VWorks user interface" on page 13

Relationships of configuration VWorks components

About this topic

This topic introduces important components used by VWorks: the protocol file, the device file, the profile, the teachpoint file, the labware database, the liquid library database, and the user database.

The topic describes what these components are and how they work together to operate your lab automation system.

What you should know

It is important to understand the way each of the main configuration components in VWorks relate. Loading some components automatically loads others. For example, loading a protocol file loads a device file.

Definitions

Refer to the table below for information about VWorks configuration components:

Component	Definition	See
Protocol file	A file that contains instructions for performing a run.	"About protocol files" on page 162
Device file	A file that contains configuration information for configured devices.	"About bar code reading and tracking" on page 292
Profile	A collection of settings, stored in the Windows registry, that manages how you connect to devices.	"About devices" on page 102
Teachpoint file	A file that saves your teachpoint settings.	The documentation provided with the robot you are using
Labware database	Labware definitions and classes stored in the Windows registry.	"Setting labware definitions" on page 337
Liquid library database	Pipetting settings, setup for different liquid types, stored in the Windows registry.	"Setting liquid-handling definitions" on page 361
User database	List of user accounts, privileges, and passwords stored in the Windows registry.	"Administrator procedures" on page 369

Configuration component relationships

Refer to the table below to understand the relationships of these VWorks configuration components:

Component	Extension	Opening this file loads...
Protocol	.pro	❑ VWorks (if it is not already running) ❑ Device file ❑ Profile for each device ❑ Teachpoint file
Device File	.dev	❑ Profile for each device ❑ Teachpoint file
Profile	None	Teachpoint file (you are prompted)
Teachpoint File	.txt	Teachpoint definitions

Related information

For information about...	See...
Exporting and importing Windows registry files	“Moving or sending a registry file” on page 372

3 Preparing for a run

This chapter describes how to start VWorks and prepare it to run an existing protocol.

All of the procedures in this chapter and the following chapter (“Performing a run” on page 59) can be performed by someone with Operator privileges.

All procedures in this chapter assume that VWorks has been installed and set up, and that protocols have been created. For information on installation, setup, and protocol creation, see:

- “VWorks installation” on page 81
- “Setting up devices” on page 101
- “Creating a protocol: basics” on page 161

Workflow for preparing a run

About this topic

This topic lists the procedures that you need to follow before performing a run in VWorks.

Workflow

The general workflow for starting VWorks and preparing for a run is given in the following table:

Step	Topic
1.	"Starting VWorks" on page 27
2.	"Logging in to VWorks and changing your password" on page 28
3.	"Opening a protocol in VWorks" on page 33
4.	"Setting general options" on page 34
5.	"Setting general error-handling options" on page 38
6.	"Notification of errors by email" on page 40
7.	"Setting protocol options" on page 41
8.	"Setting pre-protocol rules" on page 43
9.	"Setting protocol rules" on page 44
10.	"Setting log options" on page 49
11.	"Adding an alarm" on page 53
12.	"Using start/finish protocol scripts" on page 55
13.	"Printing a protocol" on page 57
14.	"Testing auxiliary bar code readers" on page 58

Related information

For information about...	See...
Performing a run in VWorks	"Performing a run" on page 59

Starting VWorks

About this topic

This topic describes how to start VWorks.

Starting VWorks

To start VWorks:

1. Make sure that everyone is clear of the lab automation system and that there are no objects that could obstruct the robot.

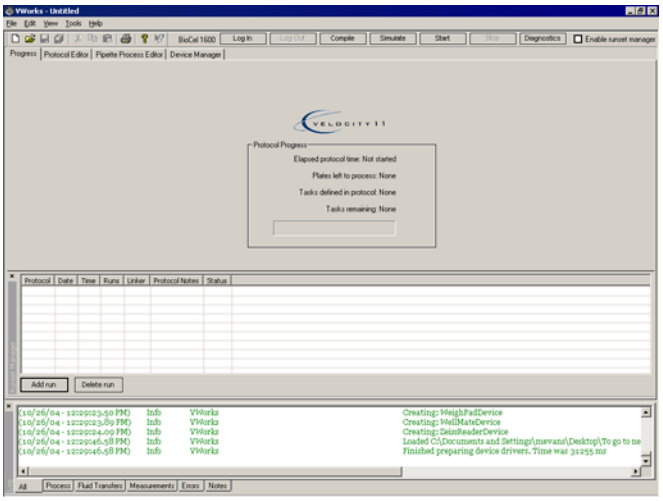
   !! INJURY HAZARD !! When VWorks starts, robot and instrument parts may unexpectedly move to their home positions.

2. Double-click the shortcut to VWorks on the Windows desktop.

   Note: If the shortcut has been deleted, open the folder C:\VWorks Workspace\bin and create a new shortcut from the executable file VWorks*version*.exe.

   The VWorks splash screen opens.

   VWorks opens at the **Progress** tab, and you are logged in with guest privileges.



Related information

For information about...	See...
What to do next	“Logging in to VWorks and changing your password” on page 28
The workflow that this procedure belongs to	“Workflow for preparing a run” on page 26

Logging in to VWorks and changing your password

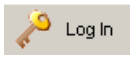
About this topic

This topic describes how to log in to VWorks and, if necessary, change your password.

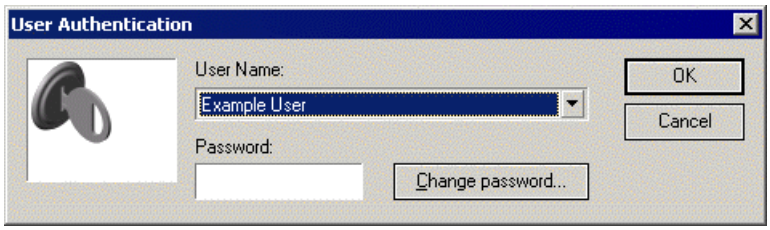
Logging in

To log in to VWorks:

1. Click **Login**.



2. Select your account **User Name** from the list box.



3. Enter your password and click **OK**.

   Note: If this is the first time anyone has logged in to this installation of VWorks, there is one administrator account and its password is blank.

Changing your password

You can change the password for your user account at any time.

To change your user account password:

1. Click the **Login** button.
2. Select your account **User Name** from the list box.
3. Click the **Change Password** button.
4. In the **Change Password** dialog box:
   a. Type your old password in the **Old** text box.

      If the **Old** text box field is gray if there is no password currently selected for the account.

   b. Type your new password in the **New** text box.
   c. Type your new password again in the **Confirm New** text box.
   d. Click **OK**.
5. Click **OK**.

Related information

For information about...	See...
What to do next	"Opening a protocol in VWorks" on page 33
The workflow that this procedure belongs to	"Workflow for preparing a run" on page 26

About tasks, processes, and protocols

About this topic

This topic defines some important terms related to protocols and processes.

In order to fully understand this guide, you need to know the definitions of the terms in this topic.

Plate icon defined

A plate icon represents the basic information about a plate or collection of plates and is the first icon in a process displayed in the protocol editor. It has associated parameters that are defined in the Task Parameters toolbar.

The information it represents includes the type of labware used in the process, how many plates are available for processing at one time, whether the plates have lids, and so on.

The following example icon represents a plate icon for a tipbox.

Task defined

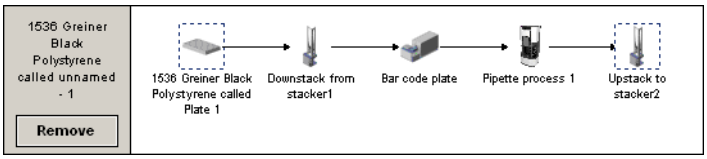
A task is an operation that is performed on one or more plates and is represented by an icon in the protocol editor. It has associated parameters that are defined in the Task Parameters toolbar.

The following example icon represents a task for upstacking or downstacking plates.

Process defined

A process is a sequence of tasks that are performed on a plate icon.

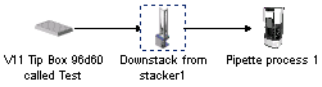
The following diagram shows a process with one plate icon and four task icons.


1536 Greiner Black Polystyrene called unnamed - 1
Remove
1536 Greiner Black Polystyrene called Plate 1
Downstack from stacker1
Bar code plate
Pipette process 1
Upstack to stacker2

How a plate icon and task differ

Although the icon for a plate icon looks like a task icon, its function is different because it does not represent an action in a protocol. This distinction becomes important when you are interpreting error messages. Consider the following example protocol and error message.

The error refers to task 2, which is the Pipette Process task in the following diagram, and not the Downstack task. The first icon is the plate icon.

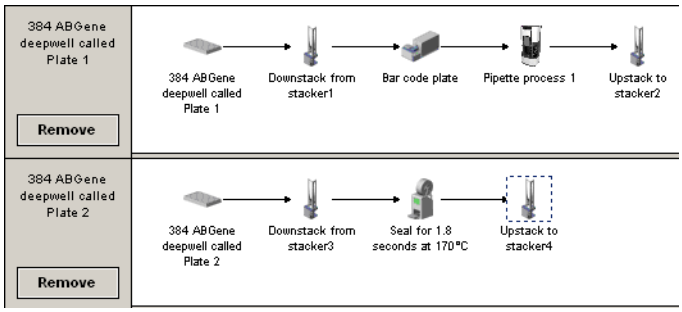


Error in Test, task 2: Pipette process 1 is required to process Test but does not

Protocol defined

A protocol is a collection of processes that run at the same time, as defined in the process editor.

The following diagram shows one protocol with two processes.



Pre-protocol defined

A pre-protocol is a collection of processes that are executed once before the protocol. The processes are created in the pre-protocol editor which is accessed by clicking the Pre-Protocol Editor tab in the main VWorks window.

Priming reservoir pumps is an example of a pre-protocol task.

When you click Start, if there is a pre-protocol, it is executed first, followed by the protocol.

Post-protocol defined

A post-protocol is a collection of processes, which are executed once after the protocol. The processes are created in the Post-Protocol editor accessed by clicking the Post-Protocol Editor tab in the main VWorks window.

A post-protocol is typically used to clean the system after a protocol run.

When you click Start, a pre-protocol may run first, followed by the protocol and then any post-protocol processes.

Pipette process task defined

A Pipette Process task is the parent of a sequence of pipette tasks that perform liquid handling procedures using a VPrep or Multimek. A pipette process is sufficiently complex that it has to be defined by a group of separate sub-tasks, each with its own parameters.

An icon for a pipette process task is shown below.

Run defined

A run is a single protocol, which includes any pre-protocol and post-protocol processes, that is performed one or more times in a series.

When you start a run, you are prompted to enter the number of cycles that you want to run. The value that you enter represents the number of times the protocol executes before the run ends. For example, a value of four means that the protocol runs four times in the series.

Pipette process link icon

The pipette process link icon is always the first icon in a pipette process. The icon performs a similar function to a plate icon in that it does not represent a task itself but is the first icon in a pipette process.

The pipette process link icon's function is to link a pipette process task in the protocol editor to a pipette process in the pipette process editor.

Pipette task defined

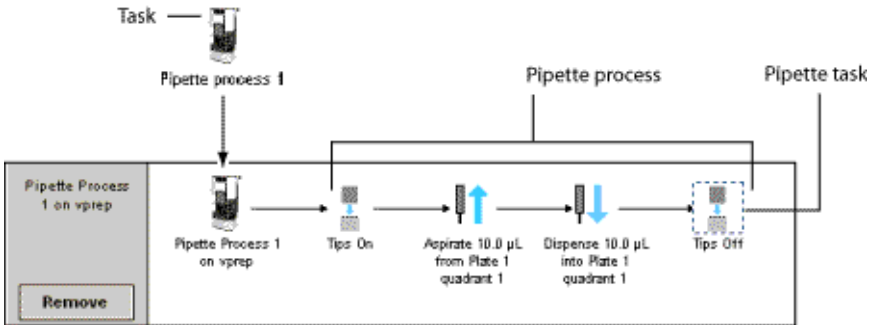
A pipette task is an operation that is performed on one or more plates by a VPrep or a Multimek. It is represented by an icon in the pipette process editor.

The following diagram shows a pipette task.

Pipette process defined

A pipette process is a sequence of pipette tasks that is performed on a specific plate, as defined in the process editor. It is a subroutine of a pipette process task.

The following diagram describes the relationship between a task, pipette process task, and a pipette process.



Related information

For information about...	See...
How to show the Pre-Protocol Editor or Post-Protocol Editor tabs	"Showing and hiding tabs and toolbars in VWorks" on page 21

Opening a protocol in VWorks

About this topic

Use the procedure in this topic to open a protocol that has already been created.

Procedure

To open a protocol:

1. Click **File** and select **Protocol File > Open**.
2. Navigate to the folder containing the protocol file.
3. Select the protocol file and click **OK**.

You can also open a protocol by navigating to the .pro file in Windows and double-clicking it. This launches VWorks and opens the protocol.

Related information

For information about...	See...
How to create a protocol	"Creating a protocol: basics" on page 161
What to do next	"Setting general options" on page 34
The workflow that this procedure belongs to	"Workflow for preparing a run" on page 26

Setting general options

About this topic

This topic describes how to configure the general options in the Options dialog box.

Overview

General options include the following:

- ❑ Location of the bar code input or data file
- ❑ Maximum robot speed
- ❑ Visibility of task icons
- ❑ General device settings
- ❑ UPS settings

When to use

Review general options after you open a protocol but before starting a run.

!! IMPORTANT !! Protocols do not store Options dialog box settings as part of the protocol. This means that all protocols use the settings that are currently selected in the Options dialog box.

Procedure

You may decide to keep all or many of the options the same for every run.

!! IMPORTANT !! If you use bar code data files, remember to select the correct file for every run.

To set general options:

1. Click **Tools** and select **Options**.
2. Make sure that the **Options** page of the **VWorks Options** dialog box is selected.
3. If you are using a bar code file, select its location:
   a. In the **Bar Code Settings** group box, click the ellipsis button (...) next to the appropriate type of bar code file.
   b. In the **Open** dialog box, navigate to the folder that contains the bar code file.
   c. Select the file (with a **.bar** filename extension for an input file and a **.dat** filename extension for a database file) and click **Open**.
4. In the **Robot Settings** group box, select the desired maximum speed of the robot movement.

   If the plate-specific robot speed (set in the **Maximum Robot Handling Speed** group box of the Labware editor) is different from the general robot speed, the slower of the two speeds is used.

   !! DAMAGE HAZARD !! If you are testing a new protocol or learning to use the system, run the robot at a slow or medium speed to reduce the risk of damage in the event of a crash.

5. Select an option in the **Protocol Editor Settings** group box, if desired.

   It is strongly recommended that you select the **Hide icons for non-configured device types** check box. This makes sure you choose the right icons for the devices available to you. This is especially important where similar icons are used for different tasks.

6. In the **Device Settings** group box, select from the following options:

Option	When selected...
Check positions for plates before every run. Use robot offset of: _ mm	The robot will move to all positions defined in the device manager to check that the positions are empty. Set the offset field so that the robot will check the position this many mm above each position teachpoint.
Check for minimum air pressure	The system air pressure is continuously monitored. If the pressure falls below the value specified in the text box, an error is generated. The units of pressure specified in the text box are pounds per square inch.
Enable BioIO on COM port	*BioCel only:* The Bio I/O functions are enabled. The COM port text box identifies the communications port to which the Bio I/O serial cable is connected. You should not need to change this number.
Check trash receptacle on BioIO input	*Biocel only:* The waste-fill sensor is activated, if your system has one. The input text box specifies the number of the Bio I/O input port to which the sensor is connected. The selected high or low radio button determines whether a high or low signal from the sensor corresponds to a full waste bin. You should not need to change these settings.
Light configuration	*BioCel only:* Selects the type of lights on your BioCel.
Enable measurements and alarms	Allows VWorks to read data from iSeries and StoreX environmental control systems and set alarms at defined thresholds.

7. *BioCel only:* In the **UPS Settings** group box, select from the following options for the uninterruptible power supply:

Option	When selected...
Use UPS on COM...	Identifies the communications port to which the UPS serial cable is connected. If more than one UPS is connected, it identifies the port for the primary UPS. You should not need to change this number.
Use additional UPS on COM...	Identifies the communications port to which a secondary UPS serial cable is connected. You should not need to change this number.
Halt scheduler when battery level drops below...	The scheduler stops scheduling tasks when the battery power falls below the percentage specified in the text box. If your BioCel has two UPSs, the value in this text box should be half of the value you would use with a single UPS. For example, if you want the scheduler to stop when the battery power drops below 80% of the total available power, type `4 0` into this text box.
Power down system when battery level falls below critical power level	When the battery power falls below the level specified in this text box, the BioCel and computer are powered down.
Additionally power down this remote system	Allows a remote computer, such as that used by a plate reader, to be shut down in the event of a power outage. Enter the network name or the IP address of the computer that you want shut down.
UPS diags	Provides information about the primary UPS, including the source of power, UPS temperature, remaining charge, and power draw.
UPS2 diags	Provides information about a secondary UPS, including the source of power, UPS temperature, remaining charge, and power draw.

8. Click **OK** to close the **VWorks Options** dialog box.

Related information

For information about...	See...
Maximum Robot Handling Speed group box in the labware editor	"Defining plate properties" on page 348
Bar code files	"About bar code reading and tracking" on page 292
What to do next	"Setting general error-handling options" on page 38
The workflow that this procedure belongs to	"Workflow for preparing a run" on page 26

About setting error-handling options

About this topic

VWorks is a complex application that requires the interaction of hundreds of parameters, configurations, and operator setup tasks for a protocol to run successfully.

Causes of errors

Errors have many causes, including poor protocol writing, incorrect operator setup, variation in plates, hardware failure, and software failure.

Handling errors during normal operation

It is important to understand that error handling is a normal part of operating a lab automation system and that when errors occur it does not necessarily mean that your lab automation system has malfunctioned.

Setting general error-handling options

About this topic

This topic describes the handling of general error options.

Procedure

To set general error handling options:

1. Click **Tools** and select **Options**.
2. Click the **Error Handling** tab of the **VWorks Options** dialog box.
3. In the **Error Reporting** group box, select the devices for which you want to report errors.

   Typically, all of the devices are selected for a run. If you want to perform a test run without plates, clear the options for devices used in the protocol that would otherwise report errors.
4. Select from the following options in the **Error Handling** group box:

Option	When checked...
Send Email when errors occur	The people listed in the **Email Setup** tab of the **VWorks Options** dialog box will receive an email for every error notification.
Halt on barcode misreads	The robot will halt the run if it encounters a bar code misread.
Halt on barcode database lookup errors	The robot will halt the run if the bar code found in the database does not match the plate bar code.
Launch program if error occurs...	A program that you specify is launched. You must specify the program by clicking the ellipsis button (...) and browsing to the program's executable. With the appropriate script, this function can be used to send a page or an email. If you want to pass the text of the error message to the program, select the **Add error text as command line argument** check box.
Halt if available disk space falls below...	The robot completes the currently scheduled step and then stops if the percentage of available hard disk space is less than the percentage specified in the text box.

5. In the **Scheduler Error Behavior** group box, select one of the following options:

Option	When selected, in the event of an error...
Process as many plates as possible	As many tasks as possible, given the error, are completed.

Option	When selected, in the event of an error...
Continue processing without starting any new plates	Tasks involving plates that are currently in the system continue. Other tasks are not scheduled.
Stop scheduler	The scheduler stops scheduling new tasks, even if plates are currently available to the robot. The current task continues to completion.

6. Click **OK** to close the **VWorks Options** dialog box.

Related information

For information about...	See...
Setting error-handling for protocols	“Setting protocol options” on page 41
What to do next	“Notification of errors by email” on page 40
The workflow that this procedure belongs to	“Workflow for preparing a run” on page 26

Notification of errors by email

About this topic

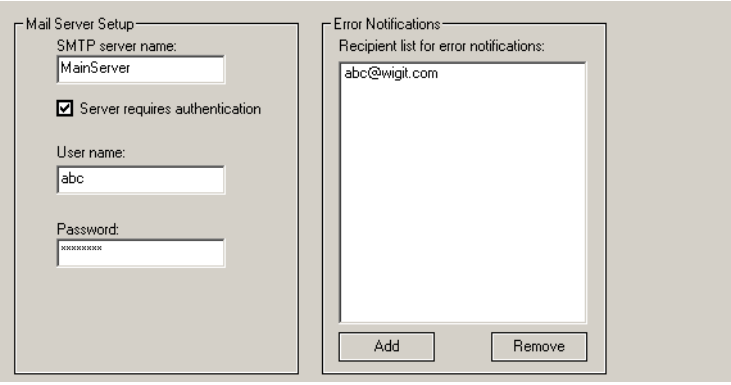
This topic describes how to add an email address to VWorks so you can be notified by email when there is a run error.

Notification of errors by email

To set up error notification:

1. Click **Tools** and select **Options**.
2. Click the **Email Setup** tab.
3. In the **Error Notifications** group box, click **Add**.
4. Click to select the **New email address** text.
5. Click once more to make the text editable.

   The text is editable when a box appears around it.



6. Type in your full email address.
7. To remove an email recipient, click to select the email address from the recipient list and then click **Remove**.
8. Click **OK** to save and close the dialog box.

About notification of errors by pager

For timely error notification, consider subscribing to a service that can page you when error-notification emails arrive.

Related information

For information about...	See...
Setting up the outgoing mail server	“Setting up email” on page 374
What to do next	“Setting protocol options” on page 41
The workflow that this procedure belongs to	“Workflow for preparing a run” on page 26

Setting protocol options

About this topic

There are five groups of protocol options.

Only the error handling options are described in this topic.

Refer to the table below to find where the other protocol options are documented.

Protocol Option	See...
Error Handling	This topic
Device File	“Loading a device file” on page 115
Description/Notes	“Compiling protocols” on page 179
Pre-protocol rules	“Setting pre-protocol rules” on page 43
Protocols rules	“Setting protocol rules” on page 44

Setting protocol error handling options

To set protocol error handling options:

1. Click **Tools** and select **Protocol Options**.
2. In the **Error Handling** group box, select any or all of the following options:

Option	Description
Attempt to put plates away if deadlock occurs	If a deadlock occurs, any lids are replaced and the plates are moved to the positions they would be in at the end of a successful protocol run.
Use VCode to correct for plates that are downstacked 180 degrees	To use this option you need a VStack, a VCode, and a password. (If you want to use this option, contact Velocity11 Service Center.) If the VStack detects a plate that is mis-oriented by 180°, the VCode will be used to reorient the plate. **!! DAMAGE HAZARD !! Careless use of this option can cause a robot crash.**
Allow processing of incorrect plate types	To use this option you need a VStack and a password. (If you want to use this option, contact Velocity11 Service Center.) If the VStack detects an incorrect plate type, the plate is still processed. **!! DAMAGE HAZARD !! Careless use of this option can cause a robot crash.**

Option	Description
Abort run if stacker runs out of plates	If the stacker runs out of plates before the run is finished, the run is aborted. Aborting a run permanently terminates the run.
Quarantine rotated plates	To use this option you need a VStack and a stacker designated as a quarantine stack. If the VStack detects a plate that is misoriented by 180°, the plate is moved to the quarantine stacker (and not processed).
Quarantine incorrect plate types	To use this option you need a VStack and a stacker designated as a quarantine stack. If the VStack detects an incorrect plate type, (for example, if the orientation sensor's threshold is exceeded) the plate is moved to the quarantine stacker (and not processed).

Related information

For information about...	See...
What to do next	"Setting pre-protocol rules" on page 43
The workflow that this procedure belongs to	"Workflow for preparing a run" on page 26
Setting allowed plate types for the VStack by specifying notch positions and limits for the optical sensor	"Defining stacker properties" on page 351
Designating a stack as a quarantine stack	"Setting up a plate icon" on page 164

Setting pre-protocol rules

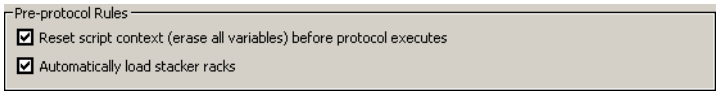
About this topic

This topic describes the pre-protocol rules in the Protocol Options dialog box.

Pre-protocol rules include

There are two rules in the Pre-Protocol Rules group box:

- ❑ Reset script context (erase all variables) before protocol executes
- ❑ Automatically load stacker racks


Pre-protocol Rules
Reset script context (erase all variables) before protocol executes
Automatically load stacker racks

Reset script context

Select this option if you want all variables to be cleared before the next protocol is executed.

Automatically load stacker racks

Select this option if you want all racks on VStacks to automatically load before the next protocol is executed.

Related information

For information about...	See...
What to do next	“Setting protocol rules” on page 44
The workflow that this procedure belongs to	“Workflow for preparing a run” on page 26

Setting protocol rules

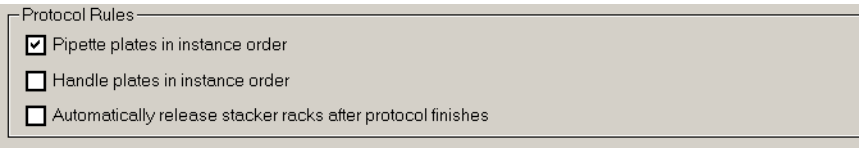
About this topic

This topic describes the protocol rules in the Protocol Options dialog box.

Protocol rules

There are three rules in the Protocol Rules group box:

- ❑ Pipette plates in instance order
- ❑ Handle plates in instance order
- ❑ Automatically release stacker racks after protocol finishes


Protocol Rules
Pipette plates in instance order
Handle plates in instance order
Automatically release stacker racks after protocol finishes

Pipette plates in instance order

Default setting

The default setting for the Pipette plates in instance order rule is for it to be checked, and it should be left checked for most protocols.

When to clear the rule

If your protocol has all of the following attributes, consider clearing the rule check box:

- ❑ The protocol has more than one pipette process that uses the same VPrep.
- ❑ The duration of one of the pipetting operations is much longer than another.

Explanation

Consider an example in which a protocol has two processes and both have a pipetting operation that uses the same VPrep. When the check box is selected, the pipetting operations for one process are completed before the pipetting operations begin for the other process.

Now consider what happens when the first pipetting operation takes significantly longer to complete than the second operation, and the protocol is run several times in succession. The overall time taken for the protocol to complete is much greater than it needs to be because during each cycle the system had to wait for the slower pipetting operations to complete for all the plates in the process before it could continue.

If the rule is turned off, a plate from the fast pipetting process can be delivered to the VPrep after a plate from the slow pipetting process, followed by another plate from the slow pipette process, and so on. This reduces the bottleneck at the VPrep because it allows the faster process to continue, and its second cycle in the series to start before the first cycle is complete.

Handle plates in instance order

Default setting

The default setting for the Handle plates in instance order is for it not to be selected.

When to select the rule

Use this rule if you need the plates to be handled in the order in which they enter the system.

Explanation

Consider a situation in which you are using the BioCel to seal plates using two PlateLocs and the first one runs out of seal, stopping on plate 5.

If this option is not selected, the second sealer would continue sealing and upstacking plates but plate 5 would be omitted and thus out of order.

If this option was selected, the second sealer would stop until you reloaded a new roll of seal and started the first sealer again and plate 5 was upstacked to its position in order.

Automatically release stacker racks after protocol finishes

Default setting

The default setting for the "Automatically release stacker racks after protocol finishes" setting is for it not to be checked.

When to select the rule

You would want to use this rule if you have one or more VStacks and you want all them to release their racks at the end of the protocol.

Related information

For information about...	See...
What to do next	"Setting log options" on page 49
The workflow that this procedure belongs to	"Workflow for preparing a run" on page 26

About log and data files

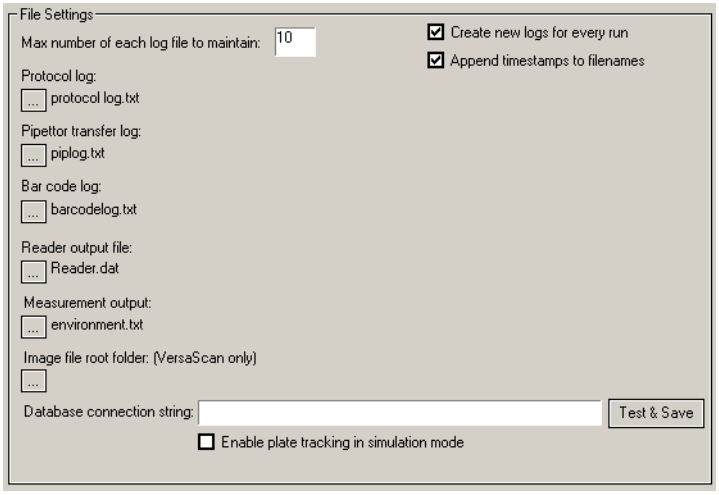
About this topic

This topic describes the different types of log and data files that are created within VWorks.

Types of log and data files

Log files record event and error information in text files that can be useful for troubleshooting. Data files record data collected by devices such as plate readers.

The location of the three log files, a data file, environment text file, and a folder are set in the Log Options page of the VWorks Options dialog box.



These are listed in the following table and described in more detail later in this topic:

File	Default file or folder name
Protocol log file	log.txt
Pipettor transfer log file	piplog.txt
Bar code log file	barcodelog.txt
Reader output file	Reader.dat
Measurement output file	Environment.txt
Image file root folder	A folder that you select

Note: You can change the default filenames to suit your own needs, but they are referred to using their default names throughout this guide.

About opening log files

You can open a log file in any text editor, but we recommend that you use the Windows application Notepad because with Notepad you can open the file during a run as the file is being written.

Protocol log file

The protocol log file records all available event and error information. The information recorded in the protocol log file cannot be modified.

During a run, you can type notes that are added to this log file.

Pipettor transfer log file

The pipettor transfer log file is a tab-delimited text file that records VPrep pipetting information on a lab automation system that has a VPrep.

Note: This log is not the same as the log generated by the VPrep.

Part of a pipettor transfer log file, opened in Notepad is shown in the following diagram.

```
03 - 12:53:56.60 PM)      VPrep 1 (96 channels)   Q1Source 1      MasterA0004     No bar code     No bar code     N
  1       (5/22/03 - 12:54:04.71 PM)      IntermediateA 1 IntA101 IntA001 No bar code     No bar code     1       1

03 - 12:54:12.78 PM)      VPrep 1 (96 channels)   Q1Source 1      MasterA0004     No bar code     No bar code     N
  1       (5/22/03 - 12:54:20.60 PM)      IntermediateB 1 IntB101 IntB001 No bar code     No bar code     1       1

03 - 12:54:27.40 PM)      VPrep 1 (96 channels)   Q1Source 1      MasterA0004     No bar code     No bar code     N
  1       (5/22/03 - 12:54:40.76 PM)      Q1Source 1      MasterA0004     No bar code     No bar code     No bar co
  0.0     OK
03 - 12:54:27.40 PM)      VPrep 1 (96 channels)   Q1Source 1      MasterA0004     No bar code     No bar code     N
  1       (5/22/03 - 12:54:49.03 PM)      IntermediateC 1 IntC101 IntC001 No bar code     No bar code     1       1
```

The pipettor transfer log contains the following information, separated by tabs:

- ❑ Aspiration timestamp
- ❑ Pipettor name
- ❑ Name of the plate aspirated from
- ❑ North bar code (of plate aspirated from)
- ❑ East bar code (of plate aspirated from)
- ❑ South bar code (of plate aspirated from)
- ❑ West bar code (of plate aspirated from)
- ❑ Quadrant of the plate aspirated from (number 1–16)
- ❑ Dispense timestamp
- ❑ Name of the plate dispensed to
- ❑ North bar code (of plate dispensed to)
- ❑ East bar code (of plate dispensed to)
- ❑ South bar code (of plate dispensed to)
- ❑ West bar code (of plate dispensed to)
- ❑ Quadrant of the plate dispensed to (number 1–16)
- ❑ Volume of liquid dispensed in microliters
- ❑ Status of the dispense

  Values are ERROR or OK. These refer to the status of the bar code verification and not the dispense itself.

Note: One log entry is created for every dispense task pair. For example, if 20 µL are aspirated and half is dispensed to one plate and half to another plate, two piplog entries are created. This example is treated as two dispense task pairs.

Bar code log file

The bar code log file contains the date and time at which each bar code is applied and the text of each field. Bar code fields are displayed in human readable form.

Measurements output log file

What is recorded

The measurements output log file records measurements made by iSeries, StoreX, and Weigh Pad devices.

iSeries measuring units

The measuring units displayed in the log file are whatever measuring units are configured on the iSeries device. Typically, the temperature is recorded in degrees Celsius and the humidity is recorded as a relative humidity percentage.

Weigh Pad measuring units

The Weigh Pad records liquid volumes as percentage of the maximum.

StoreX measuring units

The measuring units recorded by a StoreX device are temperature, in degrees Celsius, humidity in relative humidity percentage, and gas concentrations in percent (by volume).

VersaScan image file root folder

The image root folder sets the folder in which images from a VersaScan are automatically stored.

Setting log options

About this topic

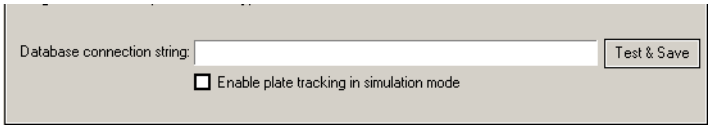
This topic explains how to configure the log options page of the VWorks Options dialog box. You may not need to configure these options for every run.

Available options

The following types of log options are available in VWorks:

- ❑ The type of log information to show in the Log toolbar of VWorks
- ❑ General settings that pertain to log and data file maintenance

- ❑ The folders in which to store log and data files
- ❑ Checking the database connection and enabling plate tracking



How messages displayed in the Log toolbar are controlled

Event and error messages are displayed in the Log toolbar. With all message options turned on, a large number of messages are displayed. For simplicity, you can hide types of messages that are not important to you.

The messages that are displayed during a run are controlled by:

- ❑ Selecting screen settings options (in the Tools > Options dialog box) before a run
- ❑ Clicking tabs in the Log toolbar during a run

Note: Screen display settings do not affect the information saved in log files. All error and event information is always saved.

Setting log options procedure

To set log file options:

1. Click **Tools** and select **Options**.
2. In the **VWorks Options** dialog box, click the **Log Options** tab.
3. In the **Screen settings** group box, select one or more of the following options, as needed:

Log Option	Writes to screen and file...
Log “task begin” events on screen	Messages at the time that process tasks are scheduled (not at the time that they are performed). This applies only to the protocol log file.

Log Option	Writes to screen and file...
Log “task complete” events on screen	Messages that confirm when process tasks are completed. This applies only to the protocol log file.
Log robot motions on screen	Robot motion events as they happen. This applies only to the protocol log file.
Log pipettor debug messages	Event messages that are generated by VPrep pipettors. This applies only to the protocol log file.
Log measurement readings	Environmental values as they are recorded in real time. This applies only to the protocol log file.

4. In the **File Settings** group box:
   a. In the **Max number of each log file to maintain** text box, type the maximum number of log files that you want to store.

      !! IMPORTANT !! After this number has been reached, each new log file replaces the oldest existing log file.

   b. Select one or more of the following options, as needed:

Log options	Description
Create new logs for every run	A separate log file is created for every run. If the check box is cleared, each run appends data to the same log file and a new log file is created when VWorks is started. This affects all log files.
Append timestamps to log file names	The date and time of the run is appended to the name of the log file. This affects all log files.

   c. Click the ellipsis button for a log file or folder.

   d. Navigate to the folder to which you want to save the log file.
   e. Click **Save**.
5. In the **VWorks Options** dialog box, click **OK**.

Related information

For information about...	See...
The database connection string (in the File Settings group box)	"Setting up the inventory management database" on page 309
What to do next	"Adding an alarm" on page 53
The workflow that this procedure belongs to	"Workflow for preparing a run" on page 26

Importing a log file to Excel

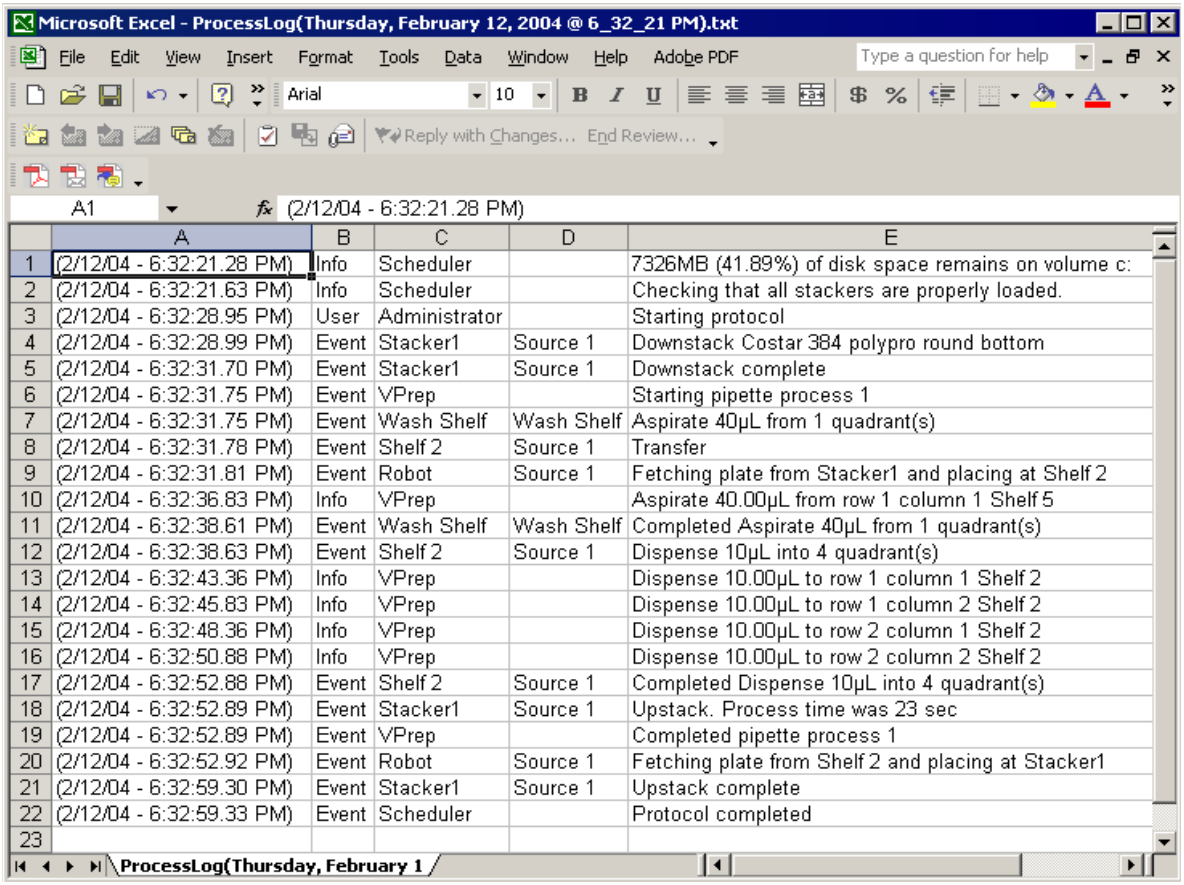
About this topic

This topic describes how to import a log file into Microsoft Excel. Log file data can then be reviewed and analyzed in Excel.

Procedure

To import a log file to Excel:

1. Open Microsoft Excel.
2. Drag the file onto the Excel window. (The data is imported.)


Microsoft Excel - ProcessLog(Thursday, February 12, 2004 @ 6_32_21 PM).txt
File Edit View Insert Format Tools Data Window Help Adobe PDF
Type a question for help
Arial 10
Reply with Changes... End Review...
A1
(2/12/04 - 6:32:21.28 PM)
ProcessLog(Thursday, February 1

	A	B	C	D	E
1	(2/12/04 - 6:32:21.28 PM)	Info	Scheduler		7326MB (41.89%) of disk space remains on volume c:
2	(2/12/04 - 6:32:21.63 PM)	Info	Scheduler		Checking that all stackers are properly loaded.
3	(2/12/04 - 6:32:28.95 PM)	User	Administrator		Starting protocol
4	(2/12/04 - 6:32:28.99 PM)	Event	Stacker1	Source 1	Downstack Costar 384 polypro round bottom
5	(2/12/04 - 6:32:31.70 PM)	Event	Stacker1	Source 1	Downstack complete
6	(2/12/04 - 6:32:31.75 PM)	Event	VPrep		Starting pipette process 1
7	(2/12/04 - 6:32:31.75 PM)	Event	Wash Shelf	Wash Shelf	Aspirate 40µL from 1 quadrant(s)
8	(2/12/04 - 6:32:31.78 PM)	Event	Shelf 2	Source 1	Transfer
9	(2/12/04 - 6:32:31.81 PM)	Event	Robot	Source 1	Fetching plate from Stacker1 and placing at Shelf 2
10	(2/12/04 - 6:32:36.83 PM)	Info	VPrep		Aspirate 40.00µL from row 1 column 1 Shelf 5
11	(2/12/04 - 6:32:38.61 PM)	Event	Wash Shelf	Wash Shelf	Completed Aspirate 40µL from 1 quadrant(s)
12	(2/12/04 - 6:32:38.63 PM)	Event	Shelf 2	Source 1	Dispense 10µL into 4 quadrant(s)
13	(2/12/04 - 6:32:43.36 PM)	Info	VPrep		Dispense 10.00µL to row 1 column 1 Shelf 2
14	(2/12/04 - 6:32:45.83 PM)	Info	VPrep		Dispense 10.00µL to row 1 column 2 Shelf 2
15	(2/12/04 - 6:32:48.36 PM)	Info	VPrep		Dispense 10.00µL to row 2 column 1 Shelf 2
16	(2/12/04 - 6:32:50.88 PM)	Info	VPrep		Dispense 10.00µL to row 2 column 2 Shelf 2
17	(2/12/04 - 6:32:52.88 PM)	Event	Shelf 2	Source 1	Completed Dispense 10µL into 4 quadrant(s)
18	(2/12/04 - 6:32:52.89 PM)	Event	Stacker1	Source 1	Upstack. Process time was 23 sec
19	(2/12/04 - 6:32:52.89 PM)	Event	VPrep		Completed pipette process 1
20	(2/12/04 - 6:32:52.92 PM)	Event	Robot	Source 1	Fetching plate from Shelf 2 and placing at Stacker1
21	(2/12/04 - 6:32:59.30 PM)	Event	Stacker1	Source 1	Upstack complete
22	(2/12/04 - 6:32:59.33 PM)	Event	Scheduler		Protocol completed
23					

Protocol log file information

The information given in a protocol log file is explained in the following table. Refer to the screenshot of the Excel file for the column letters.

Spreadsheet column	Information
A	Date and time that the entry was added
B	Type of information: ❑ Error ❑ Event ❑ Info ❑ Script ❑ User
C	Origin of the information
D	Either the: ❑ Name of the plate ❑ Name of the device, if it refers to a reagent
E	Description of the log entry

Related information

For information about...	See...
Log files	“About log and data files” on page 46

Adding an alarm

About this topic

You can set an alarm, if your lab automation system is equipped with:

- ❑ A Weigh Pad
- ❑ A StoreX incubator with environmental control
- ❑ An iSeries controller on a BioCel

For the Weigh Pad, you can set an alarm to inform you when the bottle on the Weigh Pad becomes too heavy or too light.

For the StoreX incubator and the iSeries controller, you can set an alarm to inform you when a particular temperature, humidity, or gas concentration level is reached.

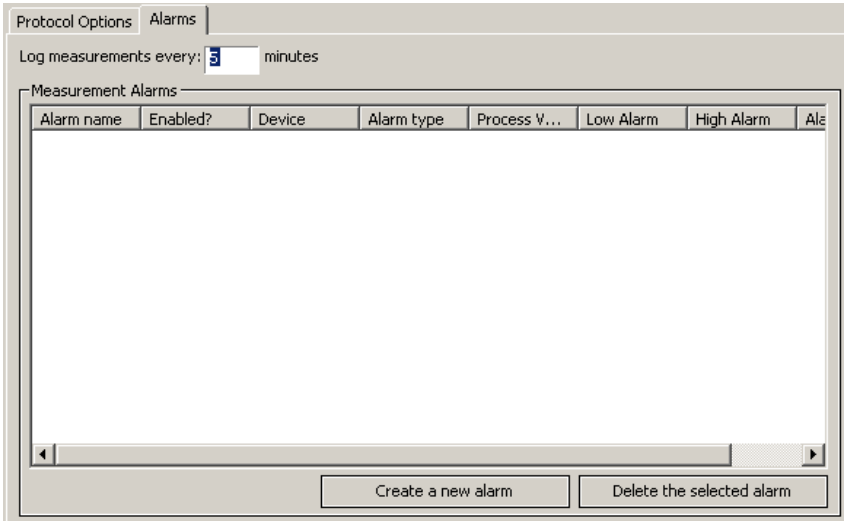
The alarm creates an error message when a measurement falls outside the range that you specify.

This topic describes how to set up such an alarm.

Procedure

To add an alarm:

1. Select **Tools > Options > Log Options**, and, in the **Screen settings** group box, select the **Log measurement readings** check box.
2. Select **Tools > Protocol Options > Alarms**.



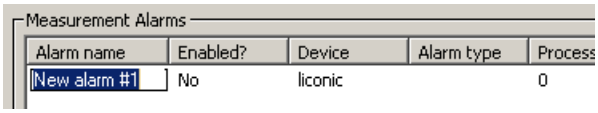
3. In the **Log measurements every** text box, type in the time interval between measurements taken by the device.

   If you change this value, the existing time interval instance expires before the change is implemented. If the existing time interval is long and you want to implement the change as soon as possible, you may need to restart VWorks.

4. Click the **Create a new alarm** button.

   A row with default values is added to the Measurement Alarms table. Click to select the row and then click a value to edit it, using the following table as a guide.

   An example of a field ready to be edited is shown below.



Field	Comments
Alarm name	A name of your choice.
Enabled?	Yes turns the alarm on.
Device	The name of the device on which the alarm is set.
Alarm type	The parameter that is being measured. It could be temperature, relative humidity, mass, volume, and so on.
Process value	The current measurement, with units being dependent on the alarm type.
Low Alarm	The low value at which you want the alarm to be turned on.
High alarm	The high value at which you want the alarm to be turned on.
Alarm Timer [minutes]	Determines when a “critical” alarm is triggered. An initial alarm error message is triggered as soon as the alarm condition is met. A second “critical” alarm is triggered after this time interval. For example, if the temperature High Alarm is 40 ºC and the Alarm Timer is 5 min, and a measurement is recorded at 40 ºC, the critical alarm is triggered five minutes after remaining above 40 ºC.

Related information

For information about...	See...
Sending email when errors occur	"Setting general error-handling options" on page 38
Monitoring environmental conditions during a run	"Monitoring a run" on page 71
The log file to which measurements are recorded	"About log and data files" on page 46
iSeries environmental control	*BioCel User Guide*
StoreX environmental control	The operating manual for your StoreX incubator

Using start/finish protocol scripts

About this topic

This topic describes how to use the Start/Finish Scripts page of the Protocol Options dialog box to set JavaScripts to run before or after all protocols.

A start script runs before any pre-protocol processes. A finish script runs after any post-protocol processes.

Procedure

To set a script to run before or after protocols:

1. Select **Tools** > **Protocol Options**.
2. In the **Protocol Options** dialog box, click the **Start/Finish Scripts** tab.
3. To enter a script to run before the protocol, type the script into the **Start Script** text box or click **Browse** to open a file that contains a script.
4. To enter a script to run before the protocol, type the script into the **Finish Script** text box or click **Browse** to open a file that contains a script.

Related information

For information about...	See...
What to do next	"Printing a protocol" on page 57
The workflow that this procedure belongs to	"Workflow for preparing a run" on page 26
JavaScript in VWorks	❑ "Using JavaScript in VWorks" on page 269 ❑ "The JavaScript task object and properties" on page 276
Running pre- and post-protocol tasks	"Setting up a pre- or post-protocol process" on page 268

Understanding the protocol

About this topic

If you are not already familiar with the protocol you intend to run, you need to take some time to understand it.

What you should know

At a minimum, you should be familiar with the following:

- ❑ Which instruments you need to prepare
- ❑ Where you need to position the plates before the run and where they are moved to during the run
- ❑ Whether User Message tasks prompt you to perform certain actions after you start the run or whether you need to perform the actions on your own initiative before you start the run
- ❑ Whether you need to replace fluids and empty waste during the run
- ❑ Whether you need to remove and add plates during the run
- ❑ Which liquids you need to prepare, where they should be placed, and in what kinds of reservoir

Related information

For information about...	See...
Printing a protocol	"Printing a protocol" on page 57

Printing a protocol

About this topic

This topic describes how to print a description of a protocol.

Printing a protocol

It may help you to refer to a printout of the protocol steps as you analyze the protocol.

To set up the printer:

1. Navigate to **File > Print Setup**.
2. Select the printer you want to print to and configure the print dialog box as required.

To print a protocol:

1. Navigate to **File > Print Preview**.
2. View the preview and, if it is satisfactory, click **Print**.

Note: If you try to print a protocol before a network printer driver is installed on the VWorks computer, you will receive an error. If this happens, contact your network administrator for help.

Related information

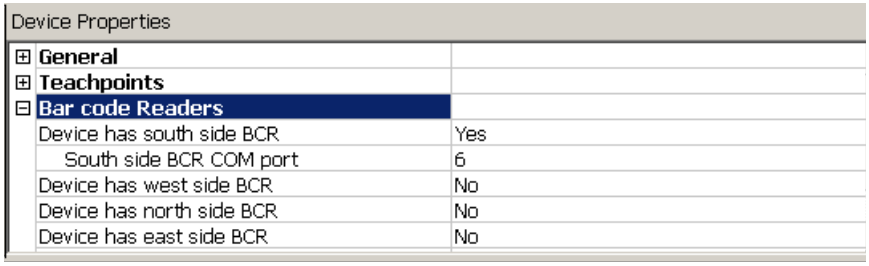
For information about...	See...
What to do next (only if you have auxiliary bar code readers on your system)	"Testing auxiliary bar code readers" on page 58
The workflow that this procedure belongs to	"Workflow for preparing a run" on page 26

Testing auxiliary bar code readers

About this topic

This topic describes how to test auxiliary bar code readers. If a device has an bar code reader, you should make sure that it is functioning and correctly aligned before starting runs.

Auxiliary bar code readers are set up in the Device Properties page.



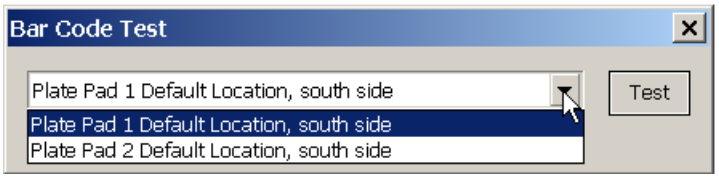
Procedure

To test auxiliary bar code readers:

1. Select **Tools** > **Test Auxiliary Bar Code Readers**.

   The Bar Code Test dialog box opens.

2. From the list box, select the reader you want to test.


Bar Code Test
Plate Pad 1 Default Location, south side
Test
Plate Pad 1 Default Location, south side
Plate Pad 2 Default Location, south side

3. Click the **Test** button.

   The result of the test appears at the bottom of the dialog box.

Related information

For information about...	See...
The workflow that this procedure belongs to	“Workflow for preparing a run” on page 26

4 Performing a run

This chapter describes how to set up and start an existing protocol run or run set.

All of the procedures in this chapter and the preceding chapter (“Preparing for a run” on page 25) can be performed by someone with Operator privileges.

Overview of performing a run

About this topic

This topic introduces the various ways you can start runs.

Ways to set up a run

There are three ways to set up and start a run.

Method	See...
Set up a single protocol run and manually start it by clicking the Start button in the VWorks	"Starting a run from VWorks" on page 61
Set up a single protocol in advance and manually start it from a command line	"Starting a run from a command line" on page 64
Set up a run set, which consists of one or more protocol runs that are started automatically, based on times that you set in advance	❑ "About starting runs automatically" on page 65 ❑ "Working with the run-set manager" on page 66

Overview

Whichever way you choose to start a run, you would typically perform a number of pre-run checks.

What you do next depends on whether you are going to run a single protocol or a run set.

If you are going to run a single protocol, at this point the protocol you plan to run has been created and opened in VWorks. The next step is to start the run, as described in "Starting a run from VWorks" on page 61.

If you are going to run a run set, you first have to create it. The following topics explain how to do this.

❑ "About starting runs automatically" on page 65

❑ "Working with the run-set manager" on page 66

During the run, you might monitor the progress, as described in "Monitoring a run" on page 71 and "Working with the Log toolbar" on page 75.

If you need to stop the run when it is in progress, follow the directions in "Pausing and stopping a run" on page 69.

When the run has ended, you would clean up, according to "Cleaning up after a run" on page 78.

Starting a run from VWorks

About this topic

This topic explains how to start a protocol run from the Start button in VWorks.

When to do this

Start a run after performing pre-run checks and opening a protocol.

Procedure

To start a run:

1. Make sure that all instruments used in the protocol are in their home positions.

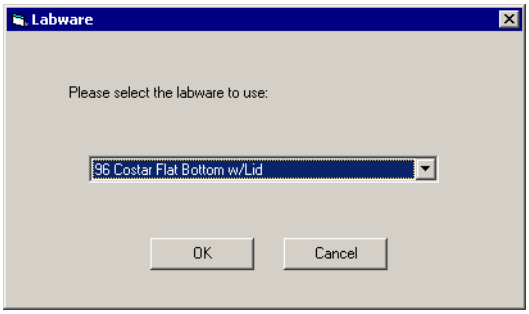
   Refer to the instruments' user guides for more information about homing.

2. In VWorks, click **Start**.

   If this is the first run with this device file, VWorks confirms communication with all devices and the devices home.

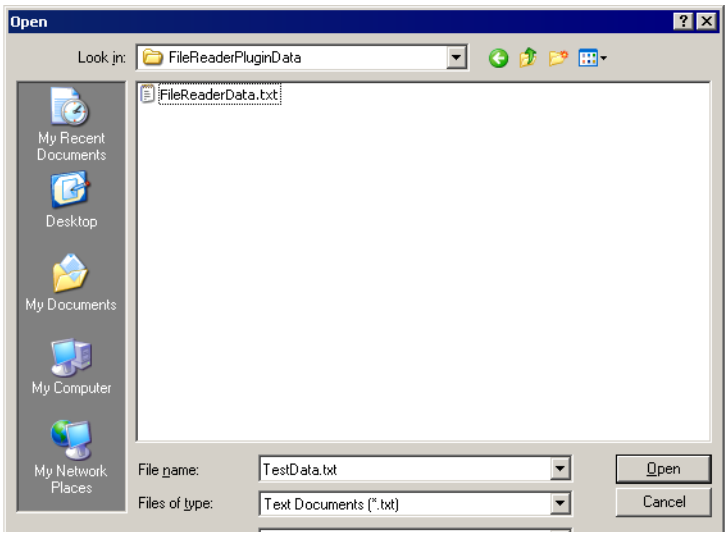
   If there are no protocol compilation errors, the **Number of Cycles** dialog box opens.

3. If you selected **from plug-in** as the plate type, the **Labware** dialog box opens asking you to select the labware type: select the appropriate labware type from the list.



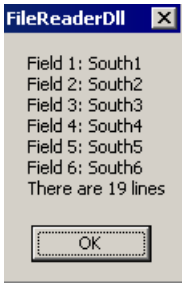
4. If you are using the **FileReader** plug-in, the **Open** dialog box opens asking you to select the text file that contains the bar code label data.

   a. Select the plug-in text file that contains the data from the **Open** dialog box. and click **Open**.



   b. In the new dialog box that opens, check the list of names of the columns of the text file and the total number of rows in the file.

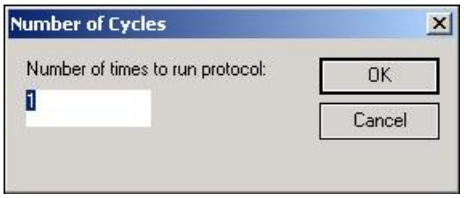
      In the following screenshot, the first six columns of the plug-in file are repeated for each side of the plate.



   c. Click **OK**.

      If the file is not the one you intend to use, you can cancel the run at the next step if needed.

5. In the **Number of Cycles** dialog box, type in the number of times that you want to execute the protocol during the run.



6. Click **OK**.

   The run starts.

7. If **User Message** tasks are included in the protocol, you are prompted to respond to them as they execute.

   If there are no **User Message** tasks to remind you to empty liquid waste containers and refill liquid source containers, set your own reminders using lab timers.

What happens after a run starts

After you start the run, the following events occur:

- ❑ The Start button becomes unavailable and the Pause button becomes available.
- ❑ Log messages on the Log toolbar indicate the start of the run. Also, Log files record events as they are performed on all plates in the Run, according to the selected log file options.
- ❑ If you selected the option for the robot to check all plate positions for plates, this operation will now be performed. If an error is found, correct the problem and click Retry.
- ❑ The first instructions of the protocol are executed.

If User Message tasks are included in the protocol, you are prompted to respond to them.

Related information

For information about...	See...
Breakpoints in runs	“Using breakpoints” on page 176
Setting up runs (overview)	“Overview of performing a run” on page 60
Checking positions for plates before every run	“Setting general options” on page 34

Starting a run from a command line

About this topic

You can start VWorks and initiate a run directly from a command line. You might do this so that you can start a run remotely or so that you can start a run of a particular protocol in fewer steps.

Procedure

To start VWorks from a command line:

1. In Windows, navigate to **Start > Run.**
2. In the **Run** text box, type `cmd` and click **OK**.

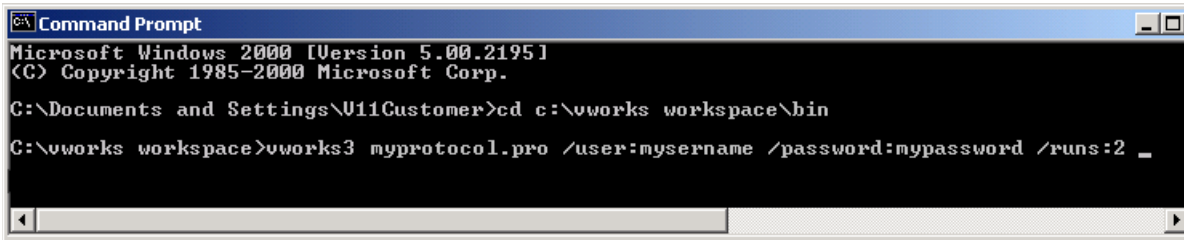
   The command prompt opens.
3. At the command prompt, change the current folder to vworks workspace by typing:

   ```
   cd \vworks workspace\bin
   ```
4. Press ENTER.
5. Type the name of the VWorks executable followed by values for the switches that specify:
   - The protocol to run
   - Your user name
   - Your password
   - The number of cycles for which to run the protocol,

   An example is:

   vworks3 myprotocol.pro /user:myusername> / password:mypassword /runs:2
6. Press ENTER to start the run.

The following screenshot shows a generic example of the completed command prompt.


Command Prompt
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.
C:\Documents and Settings\V11Customer>cd c:\vworks workspace\bin
C:\vworks workspace>vworks3 myprotocol.pro /user:mysername /password:mypassword /runs:2

Related information

For information about...	See...
Setting up runs (overview)	“Overview of performing a run” on page 60

About starting runs automatically

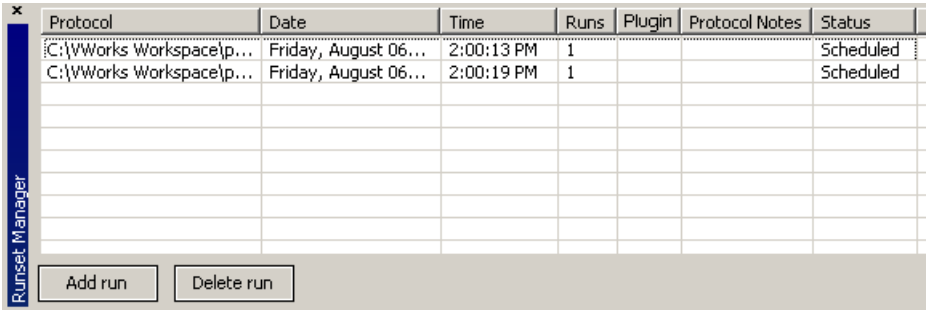
About this topic

If you want to schedule a series of runs, perhaps using a different protocol for each run, you need to create a run set. This topic provides some basic information about run sets.

Run set defined

A run set is a collection of runs that are scheduled in advance to run without operator intervention.

The run set is defined in the Run-Set Manager toolbar, which is displayed on the Progress page of VWorks.



Typical use

Run sets are typically used with systems that are meant to be run for long stretches of time unattended.

Run-set file

The data displayed in the run-set manager is stored as an XML file with the file name extension .rst, in a location selected by your VWorks administrator.

Run-set privileges

You can only save run-set files if you are logged on with an Administrator or Technician user account.

Run Options

When setting up a run set, for each run you define:

- ❑ How many times the run should cycle
- ❑ The time that each run should start

Run scheduling logic

You can create a run set while another protocol is running.

If the time to start a run scheduled by the run-set manager arrives while another run is being performed, the start is delayed. Then, when the running protocol finishes, the earliest-scheduled run in the run set starts.

Related information

For information about...	See...
Setting up runs (overview)	"Overview of performing a run" on page 60

Working with the run-set manager

About this topic

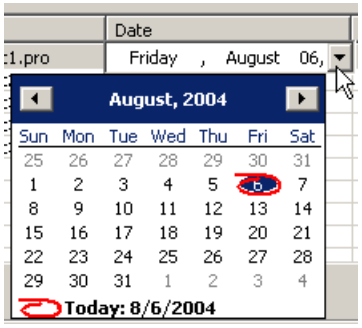
This topic describes how to create, edit, save, and open run sets.

Adding a run

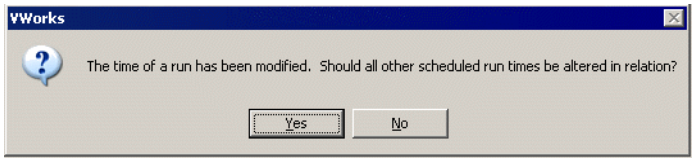
To add a run to the run set:

1. In the **Run-Set Manager** toolbar, click **Add run**.
2. In the **Select a protocol file to use for this scheduled run** browser box, navigate to, and select, the protocol file that you want to add.
3. Click **Open**.

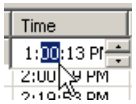
   A new row is added to the Run-Set Manager toolbar table, with a default time scheduled 5 minutes into the future.
4. If you want to schedule the run for a different day:
   a. Click in the **Date** column.
   b. Click a second time in the **Date** column to make the date editable.
   c. Click the drop-down arrow to open a calendar and select the date.



   d. If you want all other runs in a run set to be modified in relation to the changed day, click **Yes** in the VWorks dialog box.



5. If you want to schedule the run for a different time:
   a. Click in the **Time** column.
   b. Click again in the **Time** column to make the time editable.
   c. Click the group of hours, minutes, or seconds to edit.
   d. In the following example, the minutes group is selected.



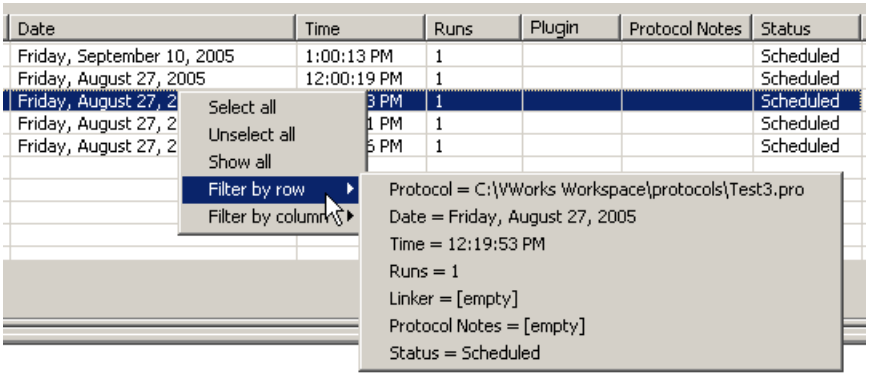
   e. Click the up or down arrows to change the value or type the new value in the field.
6. In the **Runs** column, enter a number of cycles that you want the protocol to run.
7. If you are using a plug-in (that Velocity11 has written or that you have created using the VHooks interface), click twice in the **Plugin** column and navigate to plug-in file.

Filtering runs

If you have a long list of runs in a run set, you can apply a filter to display a subset of the runs.

To filter displayed runs:

1. Right-click a cell in the Run-Set Manager toolbar that you would like to keep in the displayed selection.
2. Select **Filter by row** from the menu that appears.



3. Select the value that you would like to filter on.

   Runs that do not include this value are hidden.

After filtering a run set, you can display all runs again.

To display all runs:

1. Right-click a data-containing row in the Run-Set Manager toolbar.
2. Select **Show all** from the menu that appears.

   All runs are now displayed.

Deleting a run

To delete a run:

1. Select a row in the Run-Set Manager toolbar.
2. Click **Delete run**.

Saving run sets

To save a run set you must be logged on with an Administrator or Technician user account.

To save a run set:

1. Select **File** > **Runset File** > **Save**.

   To save the file in a different location, select **Save As**.

Opening a run set

If you open a previously created run set it is likely that some or all of the runs are scheduled to start in the past. In this case, make sure that you set new start dates and times so that they are in the future.

The run-set manager allows you to set a new start time for one run and automatically reset the start times of the other runs by the same time increment.

!! IMPORTANT !! The runs that are scheduled in the past will not start automatically.

To open a run set:

1. Select **File** > **Runset File** > **Open**.
2. In the **Open** browser box, navigate to and select the run-set file that you want to open.
3. Click **Open**.
4. Change the scheduled date and time following step 1 and step 5 in "Adding a run" on page 66.

Stopping a run set

The procedure for stopping a run set is the same as the procedure for stopping any run. For more information, see "Pausing and stopping a run" on page 69.

Pausing and stopping a run

About this topic

This topic describes the different methods of pausing and stopping a run and how the effect is different depending on the method you choose.

About stopping a run set

Pausing or stopping a run set is the same as pausing or stopping a run.

Ways to stop a run

You can stop a run by:

- ❑ Clicking Pause in VWorks, and then aborting the run.
- ❑ Pushing an emergency stop button. Runs stopped this way cannot be continued.

Before continuing with a stopped run

Before continuing with a run that was stopped, make sure that the system is in a valid state for the point of the protocol at which the run stopped. In other words, make sure that the partial completion of a task has not made changes that will cause an error or cause samples to be switched around when the run continues.

For example, errors can be caused when manually moving a plate to a position that should not have a plate.

Stopping a run using VWorks

Use VWorks to stop a run under normal circumstances, such as when you want to:

- ❑ Add or remove labware from stackers
- ❑ Clean up a spill
- ❑ Add buffer to a VPrep reservoir
- ❑ Diagnose a problem that you notice
- ❑ Perform an operation that is not part of the protocol

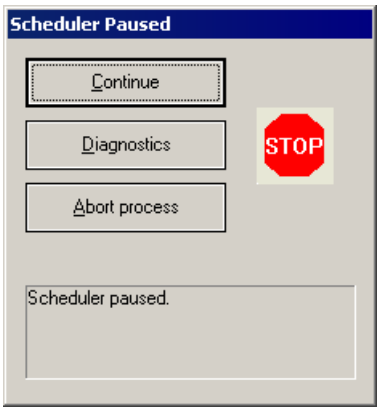
Also use VWorks to abort a run in a non-emergency situation.

When you stop a run in VWorks, the currently scheduled task continues to completion. After this you can either continue or abort the run.

To stop a run using VWorks:

1. In VWorks, click **Pause**.

The **Scheduler Paused** dialog box opens and the currently scheduled task continues to completion. This may take up to a minute. After that, no more tasks are performed.



2. You now have the following choices:

If you want to...	Then...
Continue with the run	Click **Continue**.
Troubleshoot a problem or perform a manual operation	Click **Diagnostics**, select the device that you want to interact with and open the diagnostics software.
Abort the protocol	Click **Abort Process**.

Using an emergency stop button

If your lab automation system has an emergency stop button, refer to its accompanying documentation to learn how to use it.

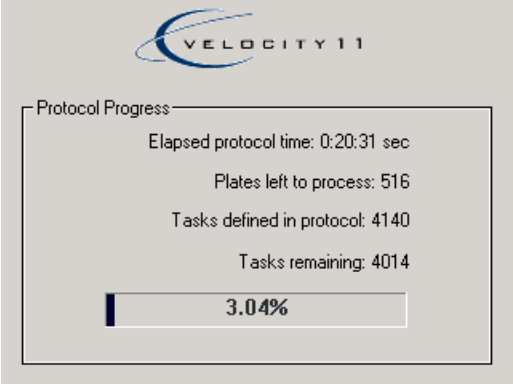
Monitoring a run

About this topic

After starting a run, the operation of the system should be monitored. This topic describes the general ways to monitor a run and points to other topics that describe how to monitor more specific aspects of a run.

Monitoring overall progress

You can monitor the overall progress of the run on the Progress page.

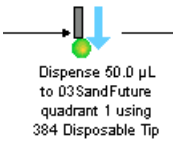


What to monitor

Exactly what you do to monitor a run depends on your lab automation system and the protocol that you are using. For example, you might need to:

- ❑ Compare the motions of the robot to the protocol tasks being completed.

  You can identify the task that is currently being performed from the position of the green ball in the process panes. Because VWorks can schedule more than one task at a time, there may be more than one green ball displayed.



- ❑ Add and remove labware.

  For more information about adding and removing labware during a run, see “Pausing and stopping a run” on page 69.

- ❑ Empty the waste bin.
- ❑ Empty liquid waste containers.
- ❑ Fill liquid reservoirs.
- ❑ Replace supplies such as plate seal and bar code labels.

System monitoring

What is monitored by VWorks during a run depends on the options selected for the protocol.

What to do if you get an error

If you get an error during a run, refer to "Maintenance and troubleshooting" on page 517 for help.

Related information

For information about...	See...
Options for system monitoring	❑ "Setting general options" on page 34 ❑ "Setting general error-handling options" on page 38 ❑ "Adding an alarm" on page 53 ❑ User guides for your devices

Monitoring UPS status on the BioCel

About this topic

If you are using the BioCel, you can monitor the UPS (uninterruptible power supply) status at any time.

Note: If you are not using a BioCel and want a UPS that can be monitored from VWorks, contact the Velocity11 Service Center.

This topic explains how to view this status in the UPS Diagnostics dialog box.

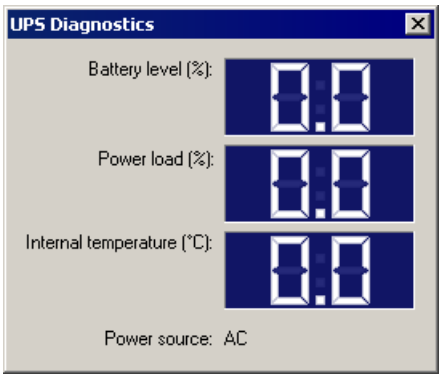
Procedure

To monitor the UPS status:

1. Select **Tools** > **Options**.
2. In the **VWorks Options** dialog box, make sure that the **Options** tab is selected.
3. In the **UPS Settings** group box, click **UPSDiags**.

   If there are two UPSs on your BioCel, you can click **UPS2Diags** for the status of the secondary UPS.

This opens the **UPS Diagnostics** dialog box.



Field	Description
Battery level	Charge in the battery as a percentage of its capacity. An alarm sounds if the power source switches to battery. The lab automation system shuts down if the battery power drops below a defined threshold.
Power load	Power drawn from the UPS as a percentage of its capacity.
Internal temperature	Temperature of the battery. For UPS temperature specifications, see the supplied user documents.
Power source	"Battery" indicates that the BioCel is running off the battery. "AC" indicates that the BioCel is not using the battery.

4. Click the close box and then click **OK** to close the dialog boxes.

Locating plates in the system

About this topic

This topic explains how to create lists of plates on your system. You can have the list ordered in two ways:

- ❑ The Find Plates command lists by plate name
- ❑ The Query Devices lists by device name

Finding plates

During a run you can find out where all of the plates in the system are.

To find plates:

1. Select **Tools** > **Find Plates**.
2. Examine the log toolbar.

   Each plate in the system is listed, along with the device at which it is located.

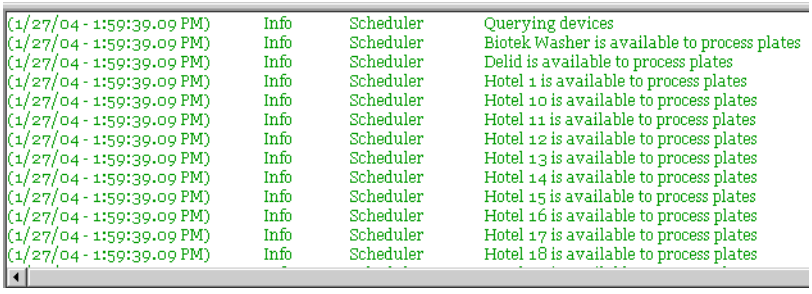
Querying devices

During a run you can find out what plates are currently at each device.

To query devices:

1. Select **Tools** > **Query Devices**.
2. Examine the log toolbar.

   Each device in the system is listed, along with the plate that is currently at that device.



(1/27/04 - 1:59:39.09 PM)	Info	Scheduler	Querying devices
(1/27/04 - 1:59:39.09 PM)	Info	Scheduler	Biotek Washer is available to process plates
(1/27/04 - 1:59:39.09 PM)	Info	Scheduler	Delid is available to process plates
(1/27/04 - 1:59:39.09 PM)	Info	Scheduler	Hotel 1 is available to process plates
(1/27/04 - 1:59:39.09 PM)	Info	Scheduler	Hotel 10 is available to process plates
(1/27/04 - 1:59:39.09 PM)	Info	Scheduler	Hotel 11 is available to process plates
(1/27/04 - 1:59:39.09 PM)	Info	Scheduler	Hotel 12 is available to process plates
(1/27/04 - 1:59:39.09 PM)	Info	Scheduler	Hotel 13 is available to process plates
(1/27/04 - 1:59:39.09 PM)	Info	Scheduler	Hotel 14 is available to process plates
(1/27/04 - 1:59:39.09 PM)	Info	Scheduler	Hotel 15 is available to process plates
(1/27/04 - 1:59:39.09 PM)	Info	Scheduler	Hotel 16 is available to process plates
(1/27/04 - 1:59:39.09 PM)	Info	Scheduler	Hotel 17 is available to process plates
(1/27/04 - 1:59:39.09 PM)	Info	Scheduler	Hotel 18 is available to process plates

Working with the Log toolbar

About this topic

This topic describes:

- ❑ The six tabs on the Log toolbar
- ❑ How to search for text in the Log toolbar
- ❑ How to add time-stamped notes and delimiters to the Log toolbar
- ❑ Clear the Log toolbar

Log toolbar

Event and error messages are displayed in the Log toolbar of VWorks.

Viewing the Log toolbar:

1. If the toolbar is not showing, from the **View** menu, select **Toolbars** > **Log**.

   The toolbar opens at the bottom of the screen.

With all message options turned on, a large number of messages are displayed during a run. For simplicity, you can hide types of messages that are not important to you. The messages displayed during a run are controlled by:

- ❑ Selecting screen setting options before a run
- ❑ Clicking tabs at the bottom of the display during a run

Log toolbar options

The following options are available for displaying screen messages.

VWorks log Tab	Displays...
All	All event and error messages. This is the same as the data that is recorded in the protocol log file.
Process	Event messages, including fluid transfer messages.
Pipettor Fluid Transfers	Event messages reported by one or more VPrep pipettors. This is the same data that is recorded in the pipettor transfer log file, but presented in a sentence format rather than a tab-delimited format. The event messages that are displayed depend on whether the “Record in transfer log” option is selected in the aspirate and dispense pipette task parameters.
Measurements	Temperature, humidity, and gas concentration measurements.

VWorks log Tab	Displays...
Errors	Errors that have occurred during the protocol, including any bar code errors. This data is not saved in a separate log, but is included in the protocol log file.
Notes	Notes that you add.

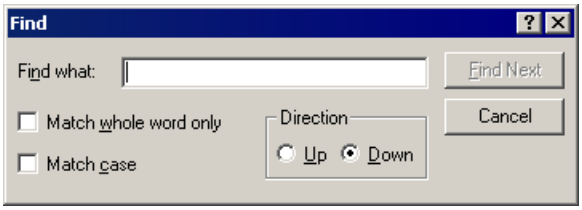
Searching the Log toolbar

You can search for specific text in the log toolbar.

To perform a search in the Log toolbar:

1. Select the appropriate tab in the Log toolbar.
2. Click in the toolbar pane.
3. Click CTRL + F.

   The **Find** dialog box opens.



Adding a note

You can type notes into the Log toolbar during a run. Any notes that you type are also incorporated into the protocol log file.

To add a note to the Log toolbar and protocol log file:

1. At the bottom of the Log toolbar, click the **Notes** tab.
2. Click in the toolbar pane at the end of a line.
3. Press ENTER on the keyboard to create a blank line.
4. Type the note.
5. Press ENTER.

   A timestamp is appended to the note.

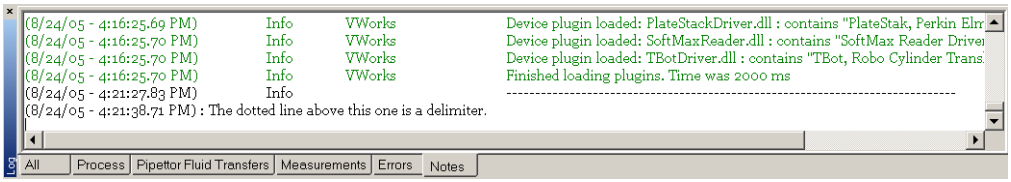
Adding a delimiter

You can add a dotted line to the Log toolbar and log file. For example, you can use this line to mark the start of a run or an important note that you add.

You can add the delimiter to all the logs (Process, Pipettor Fluid Transfers, Measurements, and so on).

To add a delimiter to the Log toolbar and log files:

1. Right-click in the Log toolbar pane.
2. Select one of the following:
   - **Add delimiter to this log**
   - **Add delimiter to all logs**


(8/24/05 - 4:16:25.69 PM) Info VWorks Device plugin loaded: PlateStackDriver.dll : contains "PlateStak, Perkin Elr
(8/24/05 - 4:16:25.70 PM) Info VWorks Device plugin loaded: SoftMaxReader.dll : contains "SoftMax Reader Drive
(8/24/05 - 4:16:25.70 PM) Info VWorks Device plugin loaded: TBotDriver.dll : contains "TBot, Robo Cylinder Trans
(8/24/05 - 4:16:25.70 PM) Info VWorks Finished loading plugins. Time was 2000 ms
(8/24/05 - 4:21:27.83 PM) Info
(8/24/05 - 4:21:38.71 PM) : The dotted line above this one is a delimiter.
Log
All
Process
Pipettor Fluid Transfers
Measurements
Errors
Notes

Clearing logs

You can clear the Log toolbar. You can clear one log or all the logs.

For example, you can do this immediately before running a protocol, so that you know that the messages you see are related to the protocol.

Clearing the Log toolbar does not clear the log files.

To clear the Log toolbar:

1. Right-click in the Log toolbar pane.
2. Select one of the following:
   - **Clear this log**
   - **Clear all logs**

Cleaning up after a run

About this topic

This topic outlines some clean-up steps that you should do after a run ends.

Procedure

Perform this procedure immediately after a run ends.

To clean up after a run:

1. *VSpin users only.* If the protocol used robotically-loaded counterweight plates, click **Yes** in the message that prompts you to unload the last counterweight that was loaded into the VSpin.

   The robot moves the counterweight plate from the VSpin to the platepad with which the counterweight is associated.
2. *VStack users only.* Click **Yes** in the dialog box that prompts you to release all VStack grippers.
3. If you have Administrator or Technician privileges and you have modified the protocol, you can save the protocol.
4. Log out of VWorks.
5. Optionally, shut down the robot and instruments on the lab automation system.

Release Protocol Stackers command (VStack only)

As an alternative to clicking Yes in step 2 of To clean up after a run:, you may want to use the Release Protocol Stackers command. When used at the end of the run, this command unloads (or releases) all VStacks that were used in the previous protocol.

To use the Release Protocol Stackers command:

1. Select **Tools** > **Release Protocol Stackers**.

Related information

For information about...	See...
Saving protocols	"Compiling protocols" on page 179
Checking log files	❑ "About log and data files" on page 46 ❑ "Importing a log file to Excel" on page 51
Logging out of VWorks	"Logging out" on page 79

Logging out

About this topic

This topic describes how to log out of VWorks.

Logging out of VWorks ensures that unauthorized users do not use your account to control the system's devices. For example, an administrator should log out after making changes in the plate editor.

Procedure

To log out:

1. Click **Log Out**.

Closing VWorks

About this topic

This topic explains how to exit from the VWorks application.

Procedure

To exit from the VWorks application:

1. Select **File** > **Exit**.

5 VWorks installation

This chapter describes how to install and uninstall VWorks.

It includes information on the minimum computer requirements and on setting up network connections between the controlling computer and the device.

Workflow for installing VWorks

About this topic

This topic outlines the procedures you need to follow to install VWorks.

Workflow

The general workflow for installing VWorks:

Step	Topic
1.	"Computer requirements and networking" on page 82. Make sure your computer meets the installation requirements.
2.	"Installing VWorks software" on page 84.
3.	"Choosing between serial and Ethernet" on page 85.
4.	"Workflows for Ethernet networking" on page 89. This topic only applies if you have chosen to use the Ethernet connection (in step 3).

Computer requirements and networking

About this topic

Before installing VWorks make sure that your computer meets the requirements given here.

Computer functions

You need a computer to run VWorks.

The computer is used to:

- ❑ Control devices on your lab automation system
- ❑ Input bar code labelling instructions
- ❑ Store and export log files
- ❑ Store and export data collected by plate readers
- ❑ Communicate with other computers on your company's network for exchange of files, reporting of errors and accessing email

Connecting computer to device

The controlling computer can be connected to devices by Ethernet or serial cables. (The controlling computer is the one that you have installed VWorks on and that you are using to control one or more devices.)

If you connect via Ethernet and the controlling computer is already connected to a company LAN or other local network, you need a second, separate network card for device-to-computer communication. This second network card allows the device to operate on an isolated network.

Note: If you purchased your computer from Velocity11, the computer has two network cards.

Minimum system requirements

Before installing VWorks, make sure that your computer has the following minimum requirements:

PC system

Any PC capable of running Windows 2000 or Windows XP

Communication interface

- ❑ Dedicated 10BaseT Ethernet port (two network cards if connecting to your company LAN)
- ❑ RS-232 serial port

Monitor

- ❑ Preferred: 1280 x 1024 resolution
- ❑ Minimum requirement: 1024 x 768

Related information

For information about...	See...
Deciding on serial or Ethernet networking	“Choosing between serial and Ethernet” on page 85
The workflow that this procedure belongs to	“Workflow for installing VWorks” on page 82

Installing VWorks software

About this topic

This topic describes how to start the VWorks installer.

Two procedures are given. If you are installing VWorks:

- ❑ For the first time on the system, use Procedure 1
- ❑ On a system where a version of VWorks is already installed, use Procedure 2

Procedure 1

To install VWorks for the first time:

1. Insert the VWorks CD-ROM into your CD-ROM drive.
2. Double-click the setup.exe file.
3. Follow the instructions in the wizard to complete your installation.

Procedure 2

If you are reinstalling VWorks or installing a newer version of VWorks use this procedure.

To install VWorks if a version of VWorks is already installed:

1. Exit the VWorks application.
2. Insert the VWorks CD-ROM into your CD-ROM drive.
3. Double-click the setup.exe file.

   You should be prompted to remove your old VWorks application. If this does not happen, you need to uninstall VWorks before continuing the new installation. See “Uninstalling VWorks” on page 99. You do not need to delete the Velocity11 registry files.
4. Follow the instructions in the wizard to complete your installation.

Related information

For information about...	See...
The workflow that this procedure belongs to	“Workflow for installing VWorks” on page 82
Uninstalling VWorks	“Uninstalling VWorks” on page 99

Choosing between serial and Ethernet

About this topic

Some devices can be connected to the controlling computer by both serial and Ethernet connections. In most cases, whether you use serial or Ethernet to connect your device depends on the device.

However, if you do have a choice of connection type for your device, reading this topic can help you decide which to use.

Connection options

You can connect one or more devices to the controlling computer using either:

- ❑ A serial network
- ❑ An Ethernet network

How to choose

Why serial might be better

Connecting the computer to devices using a serial cable is simpler than connecting with an Ethernet cable. With serial, there is no network card to install, no IP addressing to set up, and no software to install.

Serial connections have another advantage. If your controlling computer has an Ethernet network card, you do not have to use it for the lab automation network so you can use it to connect to your building's general Ethernet network. If you want to set up an Ethernet network, you will have to install a second network card.

Why Ethernet might be better

Ethernet is a faster, more reliable, and more flexible communication technology than serial. Depending on the specifications of your computer, you may experience communication problems with a serial network, in which case you will have to use an Ethernet network.

Another advantage of Ethernet networking is that you can run many devices from a single network port on your computer. Serial connections require one port for every device. If you are planning to network multiple devices, your computer may not have enough serial ports so you will have to add more.

Related information

For information about...	See...
The workflow that this procedure belongs to	"Workflow for installing VWorks" on page 82

About Ethernet networking

About this topic

This topic introduces some important concepts about Ethernet networking.

Network requirements

You can use Ethernet cables to make a stand-alone connection between the computer and a device or to connect the computer to a dedicated lab automation local area network.

Both methods require that the controlling computer has an available network card. Most computers come with one Ethernet network card, and, if you want to use this card to communicate with your lab's general network (for email, Internet access, and so on), you need to install an additional card to communicate between VWorks and the device or lab automation network.

You also need one or more Ethernet cables to make the physical connections, and, if you plan to connect multiple devices, you need an Ethernet switch to connect the single Ethernet cable attached to your computer with the multiple Ethernet cables of the devices.

About IP addresses

IP address function

The computer's network card and each device on the network must be assigned a different number, called an IP address. IP addresses allow computers and devices to be uniquely identified on a network so that information can be specifically routed to them.

Ways to assign an IP address

There are two ways to assign an IP address:

- ❑ Statically, by assigning it manually so that it never changes.
- ❑ Dynamically, by automatically assigning a new address every time the computer or device is turned on.

  Dynamic assignment uses DHCP (Dynamic Host Configuration Protocol) software.

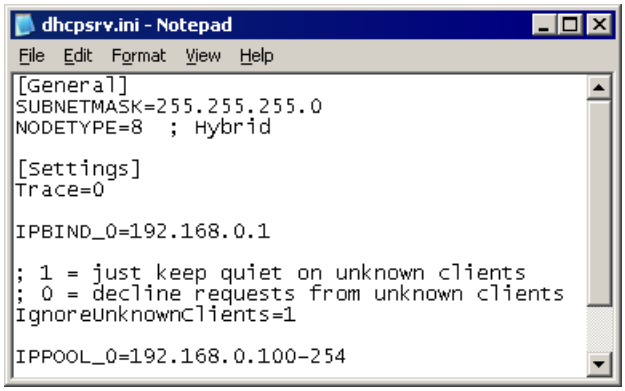
Network card and IP addresses

It is important to consider separately the IP address of the computer's network card, and the IP addresses of the devices on the network.

The computer's IP address

The network card of the computer that is controlling the devices on a lab automation network always has a static IP address. This is even the case when the devices are dynamically assigned addresses because of the way that DHCP servers work. DHCP servers are usually configured to start when Windows starts.

When the server starts, it reads an initialization file that points it to the network card through which the computer will serve addresses. A screenshot of the initialization file is shown below.



Because the IP address and subnet mask in the file is static, the value of the network card's IP address and subnet mask must always match the values in this file.

!! INJURY HAZARD !! It is possible to run a device on a general network in which both the device and the controlling computer have dynamic IP addresses but we caution against this for safety reasons. Remote computer operators may accidentally initiate an operation that causes the device to move unexpectedly when lab personnel are nearby.

If the computer is also part of a general network, it requires a second network card. This card probably has a dynamic IP address because the computer does not control the network and the computer is easier to administer this way.

The devices' IP addresses

The devices can have IP addresses that are either static or dynamic.

Choosing an addressing method

Whether to assign the IP address of the device statically or dynamically, depends on the network's architecture.

With a stand-alone connection

If you are connecting a single, stand-alone device that will be set up this way long-term, set the IP address of the device statically (or use a serial connection). This saves you from having to add a second network card to your computer and install DHCP server software.

When integrating into an existing LAN with DHCP

If you are connecting a device to an existing network that is already running a DHCP server, it is strongly recommended that you dynamically assign the IP address of the device, and leave the statically set IP address of the computer's network card as it is.

When setting up a new LAN connection

If you are setting up a new network, you must decide whether to use static or dynamic IP addressing for the device.

In general, if you have more than a few devices on your network it is more convenient to use automatic addressing because you can remove and add devices without having to set up their IP addresses statically each time. If you only have a few devices, it may be more convenient to set them statically and avoid having to set up the DHCP software.

DHCP Server Kit

To make it easier for you to set up an Ethernet network, Velocity11 sells a DHCP Server Kit that includes:

- ❑ A networking card
- ❑ An Ethernet cable
- ❑ An Ethernet switch
- ❑ DHCP server software

The server supplied in the DHCP Server Kit works with computers running a Windows XP or 2000 operating system.

Without the kit, you need to obtain the necessary parts yourself.

Related information

For information about...	See...
Deciding on serial or Ethernet networking	"Choosing between serial and Ethernet" on page 85
Physically connecting the controlling computer to an instrument	"Connecting Ethernet cables" on page 93
Setting a static IP address for an Ethernet connection to a stand-alone instrument	"Setting the network card's IP address" on page 90
The workflow that this procedure belongs to	"Workflow for installing VWorks" on page 82

Workflows for Ethernet networking

About this topic

If you have not yet decided whether to use a serial or Ethernet connection to connect your device to the controlling computer, read "Choosing between serial and Ethernet" on page 85.

This topic guides you through the Ethernet connection setup process according to the type of network you want to set up.

Ethernet connection workflow

This is the workflow you use to set up an Ethernet connection.

Skip step 6 if you are assigning IP addresses statically.

Step	Topic
1	"About Ethernet networking" on page 86
2	"Setting the network card's IP address" on page 90
3	Setting the device's IP address Refer to the device documentation
4	"Connecting Ethernet cables" on page 93
5	"Checking the network card's IP address" on page 95 *Optional.* You can do this at any time.
6	Dynamic IP addresses only: "Installing and starting DHCP server software" on page 96
7	"Turning off Ethernet firewall software" on page 98

Setting the network card's IP address

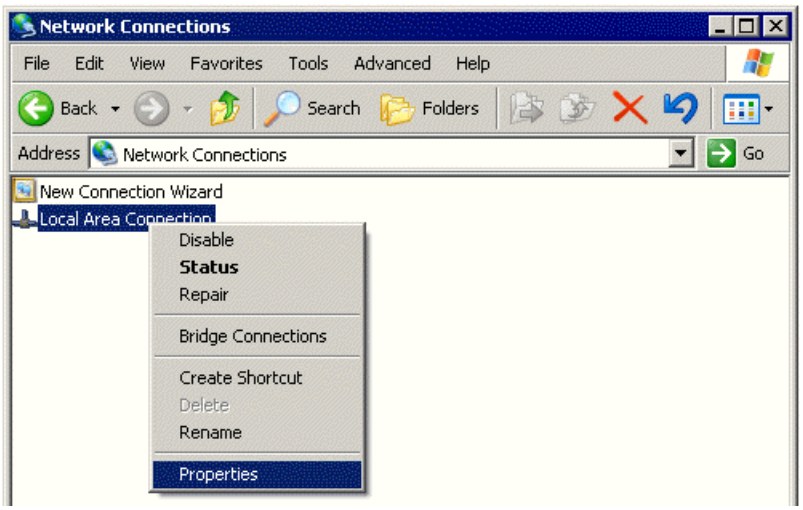
About this topic

This topic describes how to manually set a static IP address for an Ethernet connection between the controlling computer and a device.

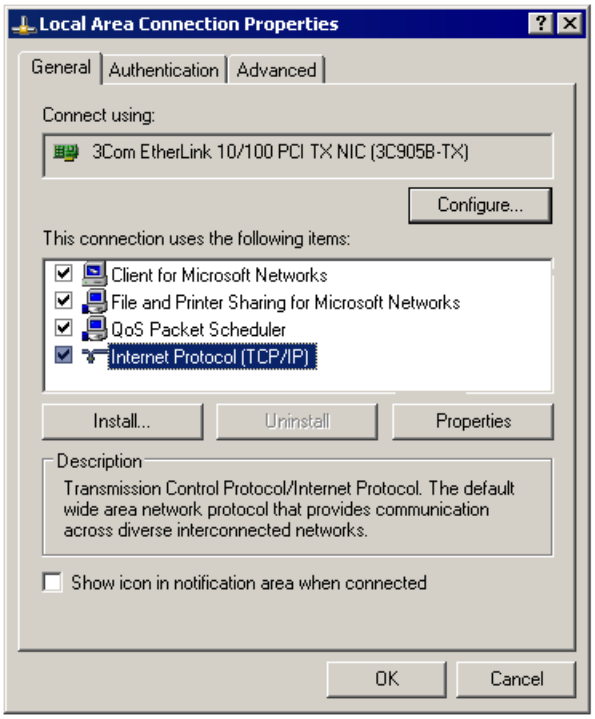
Procedure

To manually set the network card's IP address:

1. In Windows, click **Start** > **Settings** > **Network and Dial-up Connections**.
2. Right-click the icon for the new local area connection (which may be **Local Area Connection 2** on your system), and click **Properties**.



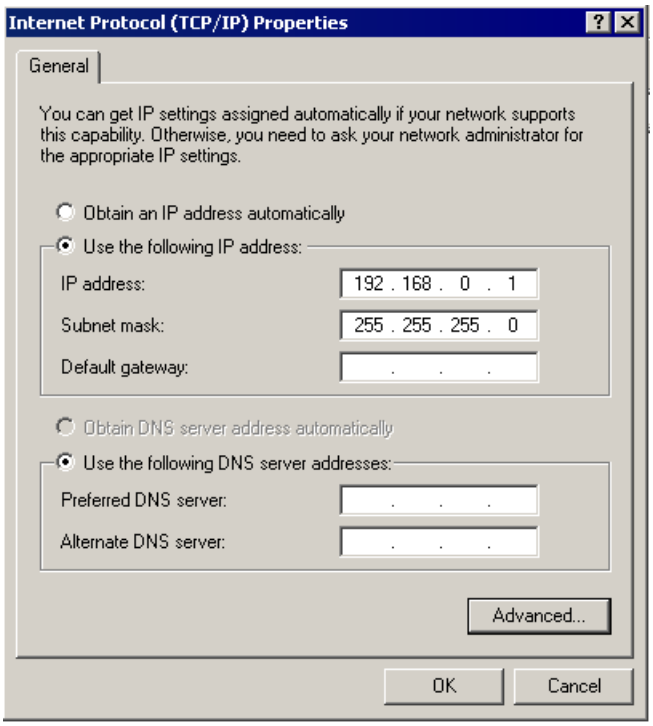
3. Double-click **Internet Protocol (TCP/IP)**.



4. Select **Use the Following IP address,** and enter the IP address and the subnet mask.

   If you are using the DHCP server software provided by Velocity11, set the IP address to `192.168.0.1` and the subnet mask to `255.255.255.0`

   This manually configures the IP address of the card.


Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
192 . 168 . 0 . 1
Subnet mask:
255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

5. Click **OK**.
6. Close the **Network Connections** window.

About setting devices' IP addresses

You also need to set the IP addresses for the devices on the network. This may require connecting to the devices with a serial cable and using HyperTerminal to change the IP addresses in the devices' firmware.

Details about how to do this should be provided by the manufacturer of the device.

Related information

For information about...	See...
The workflow that this procedure belongs to	"Workflow for installing VWorks" on page 82
Installing the DHCP server software from Velocity11	"Installing and starting DHCP server software" on page 96

Connecting Ethernet cables

About this topic

This topic describes how to connect the Ethernet cable from the controlling computer to your instrument.

Ways to connect

You can use Ethernet to connect a device to the computer:

- ❑ Directly
- ❑ Through a switch

If you are setting up a stand-alone device, you can use either method. If you are setting up a local area network that has other devices on it, follow only the directions for using a switch.

Before you begin

Before starting this procedure and if you are setting up a new network, make sure that the IP address of the computer's network card has already been statically assigned.

Connecting directly

To connect your device directly to the computer, you need a crossover Ethernet cable, which can be obtained from a computer supply retail outlet.

To connect directly to the computer with Ethernet:

1. Connect a crossover Ethernet cable to the Ethernet port of the connections panel.
2. Connect the other end of the cable to the Ethernet port of the computer.

Connecting through a switch

An Ethernet switch connects the single cable coming from the computer to one or more cables that lead to one or more devices. A switch is included in the Velocity11 DHCP Server Kit.

Note: Do not use a crossover cable with a switch. The switch performs the crossover function.

If you are setting up a new network, connect the Ethernet switch to the computer and then connect the devices to the Ethernet switch using the procedures in this section.

If you are adding devices to an existing LAN, you do not need to perform the first procedure because the switch should already be connected.

To connect the switch to the computer:

1. Connect the power cord to the switch.
2. Plug one end of the Ethernet cable into any Ethernet port of the switch.
3. Plug the other end into the available Ethernet port of the computer.

To connect a device to the switch:

1. Plug one end of a second Ethernet cable into any available port of the Ethernet switch.
2. Plug the other end into the Ethernet port of the device.

Connecting additional devices

You can connect as many devices to the network as there are Ethernet ports available.

Related information

For information about...	See...
The workflow that this procedure belongs to	“Workflows for Ethernet networking” on page 89

Checking the network card's IP address

Introduction

When setting up an Ethernet network, you might want to verify the IP address of the network card in the computer. This topic describes how to do that.

Before you start

Before you can check the IP address of a computer, the computer's network card must have been manually assigned an address.

Procedure

To check the IP address of a computer's network card:

1. On the computer whose IP address you want to check, in Windows, navigate to **Start** > **Programs** or **All Programs** > **Accessories** > **Command Prompt**.

   A Command Prompt window opens.

2. Type `ipconfig` and press ENTER.

   One IP address for every network card in your computer is shown.

Related information

For information about...	See...
Ethernet networks	"About Ethernet networking" on page 86
The workflow that this procedure belongs to	"Workflows for Ethernet networking" on page 89

Installing and starting DHCP server software

About this topic

Follow the procedure in this topic if you are using the DHCP server software provided by Velocity11 to set up your Ethernet local area network with dynamic IP addressing. Make sure that you have already connected your device to the computer.

You can choose to use DHCP server software from another source if you prefer.

What is a DHCP server

A DHCP server is a software program that dynamically assigns IP addresses to devices in a local area network when they are turned on. Once installed, the server runs as a service that starts automatically when you start the computer.

The server software is included in the DHCP Server Kit from Velocity11.

!! IMPORTANT !! You should only run one DHCP server on one network, so do not install the Velocity11 DHCP server if you are integrating your device into an existing network that has dynamic IP address assignment.

Installation procedure

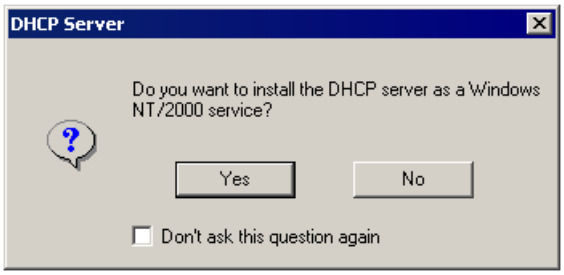
Note: Because the DHCP software runs as a service, you may need additional privileges on the controlling computer to install it. Please check with your network administrator if you think you may not have sufficient privileges.

To install and start the DHCP server software:

1. Create the following folder on the controlling computer:

   C:\Program Files\Velocity11\DHCP server
2. In Windows, navigate to the VWorks CD-ROM drive.
3. Navigate to the folder and copy all of the files into the new folder on your computer's hard drive.
4. Double-click the file named dhcpsrv.exe.

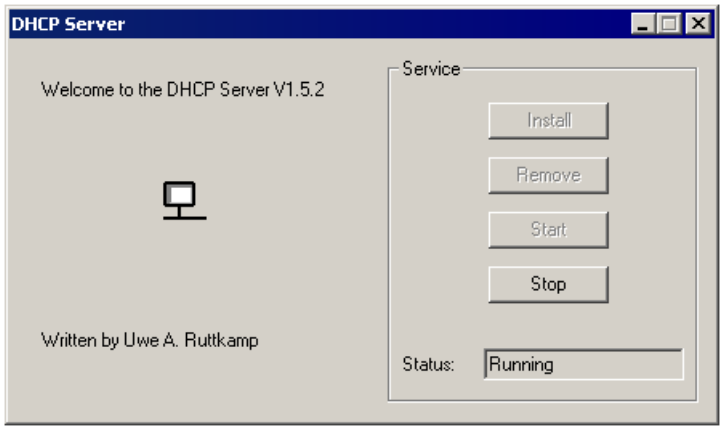
   The **DHCP Server** window opens.



5. Click **Yes.**

   This installs the DHCP server on your computer.

   The **DHCP Server** window opens and displays the status as **Running**.



6. Click the close box to close the window.

Stopping and starting the service

There are two ways to stop and start the server service.

To stop and start the DHCP server from Windows:

1. Navigate to **Start** > **Programs** or **All Programs** > **Administrative Tools** > **Services**.

   Consult your Windows documentation for more information about working with services in this way.

To stop and start the DHCP server using the DHCP server file:

1. Navigate to C:\Program Files\Velocity11\DHCP server.
2. Double-click the file named dhcpsrv.exe.
3. Click **Stop** to stop the service or **Start** to start the service.

Related information

For information about...	See...
Ethernet networks	“About Ethernet networking” on page 86
The workflow that this procedure belongs to	“Workflows for Ethernet networking” on page 89

Turning off Ethernet firewall software

Introduction

If you are using an Ethernet network, read this topic to learn about the effect of firewalls and how to turn them off.

Firewall defined

A firewall is a security system that protects a computer on an Ethernet network against external threats.

Types of firewall

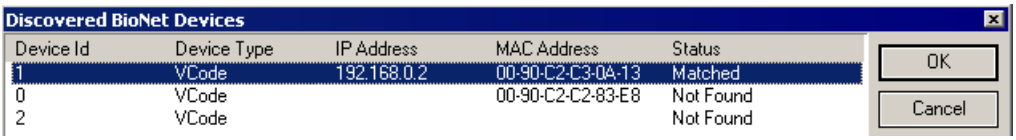
Hardware firewalls protect computers from threats outside the local network. Software firewalls prevent worms from propagating on the internal network.

Sources of software firewall

The computer controlling your device may have one or more software firewalls running on it. There are two software firewall sources to be concerned with:

- ❑ Windows XP operating system has a built-in firewall that may be turned on by default or may have been turned on by someone in your organization.
- ❑ Your computer may be running a separate firewall program that your organization has purchased and installed.

Either of these types of firewall can prevent the devices on the network from showing up in the Discovered BioNet Devices dialog box.



With dynamic IP addressing

If your Ethernet network is using dynamic IP addressing, the firewall may block the request for an IP address from your device when it is turned on.

With static IP addressing

If your Ethernet network is using static IP addressing, the VWorks software sends out a request for devices on the network to identify themselves, but the firewall may block the response.

About turning off firewalls

To turn off the firewall for your operating system, follow the directions in Windows Help and Support on your computer.

To turn off a separate firewall program, follow the directions in the documentation that accompanies the program. You can either uninstall the program or stop it. If you choose to stop it, make sure that the program is not configured to start up again every time you restart the computer.

Passing data through the firewall

If your organization insists that a firewall should remain on, it is possible to configure the firewall to allow data that is transmitted on a particular port to pass through.

If you are using dynamic IP addresses the firewall should pass data though on UDP ports 67 and 7611.

If you are using static IP addresses, the firewall should pass data though on UDP port 7611.

For help configuring the firewall, consult an experienced network administrator.

Related information

For information about...	See...
The workflow that this procedure belongs to	"Workflows for Ethernet networking" on page 89

Uninstalling VWorks

About this topic

This topic describes two ways to uninstall VWorks.

When to remove Velocity11 registry files

In general, it is sufficient to uninstall the VWorks program without removing the registry files. However, you can remove the Velocity11files from the registry if:

- ❑ You want to make a completely fresh start with VWorks, removing all user accounts, teachpoints, device profiles, and liquid and labware definitions, or
- ❑ You do not intend to run VWorks on your system again

Procedures

To remove VWorks:

1. Use the Add / Remove Programs control panel.

   For more information, see the online help for your Windows operating system.

!! IMPORTANT !! The following procedure deletes the user accounts, labware definitions, liquid library data, device profiles, and teachpoints.

To remove the Velocity11 files from the registry:

1. From the Windows **Start** menu, select **Run**.
2. In the **Open** text box, type `regedit`.
3. Click **OK**.

   The Windows registry editor opens.
4. Expand folders to select the following folder:

   HKEY_LOCAL_MACHINE\SOFTWARE\Velocity11
5. Make sure you have selected the Velocity11 folder.

   !! IMPORTANT !! Making a mistake and deleting the wrong registry folder may cause critical failures with your operating system.
6. Select **Edit** > **Delete**.

Related information

For information about...	See...
Types of information stored in the registry	“Relationships of configuration VWorks components” on page 22
Exporting Velocity11 data from the registry files (for example, before clearing the registry)	“Moving or sending a registry file” on page 372

6 Setting up devices

This chapter is for people with Administrator or higher privileges.

Before you can start using VWorks to control your lab automation system, you need to set up your instruments and robots as devices in VWorks. This chapter describes how to do this.

About devices

About this topic

This topic introduces devices and the device file.

Device defined

A device is an item on your lab automation system that has an entry in the device manager. A device can be a robot, an instrument, or a location on the lab automation system that can hold a piece of labware.

Examples of devices:

- ❑ Velocity11 robot
- ❑ Human robot
- ❑ PlateLoc Thermal Plate Sealer
- ❑ Labcyte Echo550
- ❑ Platepad
- ❑ VPrep shelf
- ❑ Waste

Device file defined

The data entered into the device manager and saved as a device file contains the configuration information for your devices.

Device file location

Device files have the file name format <*file name*>.dev and are stored in the folder location that you specify when saving the file.

Related information

For information about...	See...
Setting up devices	“Workflow for setting up devices” on page 106

About profiles

About this topic

This topic introduces profiles. Profiles are required for most but not all devices.

Profiles defined

A profile contains the communication settings needed for communication between a device and VWorks. The data in a profile is used by VWorks to identify each device on the network.

A profile can also contain other basic settings that you are unlikely to want to change once set up.

Because profiles identify each device, every device on the network must have its own profile.

You can create, modify, and delete profiles as you need to.

Stored settings

Profiles are stored in the Windows registry.

The settings stored in a profile include:

- ❑ Whether the device is connected using serial or Ethernet
- ❑ If the device is connected using Ethernet, the Device ID of the device on the network
- ❑ If the device is connected using serial, the COM port with which the controlling computer uses to communicate

Related information

For information about...	See...
Creating profiles	“Creating a profile and setting the properties for a device” on page 108

About diagnostics software

About this topic

This topic introduces diagnostics.

Background

The devices can be controlled in real time directly through the VWorks diagnostics software using simple commands.

Diagnostics software is used for:

- ❑ Troubleshooting
- ❑ Setting teachpoints
- ❑ Performing manual operations outside a protocol

  For example, if an error occurs during a run that leaves a plate and the robot where they should not be, you can use the robot diagnostics to move the plate and return the robot to its home position.

Types of diagnostics software

Instruments manufactured by Velocity11 include their own diagnostics software. You can find instructions for using this software in the relevant user guide.

Related information

For information about...	See...
Creating profiles	“Creating a profile and setting the properties for a device” on page 108

Opening diagnostics software

About this topic

This topic describes how to open the diagnostics software for any configured instrument.

Procedure

To open the diagnostics window:

1. In VWorks, click the **Device Manager** tab.
2. Select the desired device from the **Device List**.

   Expand the general name of the device, if necessary.
3. Select the particular device with which you want to communicate.
4. Click **Device Diagnostics** located at the bottom of the **Device List** toolbar.

   The **VWorks Diagnostics** dialog box opens.

Related information

For information about...	See...
Setting up devices	“Workflow for setting up devices” on page 106
Adding a device	“Adding devices” on page 107
Creating a profile and setting device properties	“Creating a profile and setting the properties for a device” on page 108
Opening a device file	“Loading a device file” on page 115

Workflow for setting up devices

About this topic

This topic outlines the procedures you need to follow to set up a device file.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating a profile and setting the properties for a device" on page 108

Related information

For information about...	See...
Opening device files	"Loading a device file" on page 115

Adding devices

About this topic

This topic describes how to:

- ❑ Create a new device file (if one does not already exist)
- ❑ Add devices
- ❑ Save the device file

Procedure

You need to add a device for each instrument and robot in your lab automation system.

To add devices to a device file:

1. Make sure that the devices are physically networked to the VWorks computer and turned on.
2. Start VWorks and login as an Administrator.
3. Do one of the following:
   - ◆ If you have an existing device file that you want to add to, navigate to **File** > **Device File**, click **Open,** and select your device file.
   - ◆ If you are creating a new device file, navigate to **File** > **Device File** and click **New**.
4. Click the **Device Manager** tab.
5. Click **New Device** in the **Device List** toolbar and enter a name for the device you are adding.
6. In the **Device Properties** window, set the **Device type**.

   The default type is Plate Pad, Standard.
7. Repeat step 5 and step 6 for each device.
8. Select **File** > **Device File** > **Save**.

   If you are creating a new device file, you are prompted to enter a name for your device file.

   Alternatively, you can select **File** > **Save All**. This saves the device file and the current protocol file at the same time.

Related information

For information about...	See...
What to do next	“Creating a profile and setting the properties for a device” on page 108
The workflow that this procedure belongs to	“Workflow for setting up devices” on page 106

Creating a profile and setting the properties for a device

About this topic

This topic describes how to set device properties and create profiles for the devices you added to the device file.

For each device, you need to:

- ❑ Set the generic device properties

  This sets general information such as allowed labware and which robot accesses the device.

- ❑ Set the device-specific properties

  This sets specific information such as the type of communication the device is using.

- ❑ Create a profile

  This sets information such as the COM port that the device uses.

Procedure

The profile settings and device properties that you need to set up vary according to the device.

You need to refer to the device-specific documentation for detailed instructions. Some devices are documented in this guide, and others are in the *Device Driver User Guide*.

To create a profile and set properties for a device:

1. Create a profile for the device. (See the following table.)
2. Set the generic properties for the device. (See "Setting the generic properties for a device" on page 112.)
3. Set the specific properties for the device. (See the following table.)
4. Save the device file: Select **File** > **Device File** > **Save**.

   The next time you compile or run a protocol that references the device file, the new devices are registered with the Windows operating system.

Look up table

This table lists where you need to look to get more information about setting profiles and device-specific properties for each device.

For this device	Look here to set up a profile...	And, look here to set device properties...
Bio-Tek Washer	*No profile required*	"Setting the Bio-Tek device properties" on page 390
Cavro Pump Network	*Device Driver User Guide*	

For this device	Look here to set up a profile...	And, look here to set device properties...
Delid Station (Vacuum)	*No profile required*	"Setting the delid station device properties" on page 121
Flexispense	*No profile required*	"Setting the FlexiSpense device properties" on page 421
Flexispense-M	"Creating a FlexiSpense-M profile" on page 429	"Setting the FlexiSpense-M device properties" on page 430
FLIPR Tetra	*Device Driver User Guide*	
Genetix Aliquot	"Creating an AliQuot profile" on page 379	"Setting AliQuot device properties" on page 382
Genetix QFill	"Creating a QFill profile" on page 467	"Setting QFill device properties" on page 468
Human Robot	*No profile required*	"Setting the human robot device properties" on page 123
Innovadyne Nanodrop	"Creating a Nanodrop profile" on page 459	"Setting the Nanodrop device properties" on page 461
Labcyte Echo550	"Creating an Echo 550 profile" on page 399	"Setting the Echo 550 device properties" on page 400
Labcyte Echo550 Destination Stage	*No profile required*	"Setting the Echo 550 destination stage device properties" on page 403
Labcyte Echo550 Source Stage	*No profile required*	"Setting the Echo 550 source stage device properties" on page 402
Lid Hotel	"Workflow for configuring the lid hotel" on page 126	
Lid Hotel Storage Bay	"Workflow for configuring the lid hotel" on page 126	
Multidrop	"Creating a Multidrop profile" on page 439	"Setting the Multidrop device properties" on page 440
Multimek	*Device Driver User Guide*	
Peak Robotics KiNEDx Robot	*Device Driver User Guide*	

For this device	Look here to set up a profile...	And, look here to set device properties...
PerkinElmer Envision Reader	"Creating an Envision profile" on page 413	"Setting the Envision device properties" on page 415
PerkinElmer PlateStak	*Device Driver User Guide*	
PlateHub	*Device Driver User Guide*	
Plate Pad, Filter Plate	*No profile required*	"Workflow for configuring the platepad" on page 136
Plate Pad, Standard	*No profile required*	"Workflow for configuring the platepad" on page 136
Plate Pad, Vacuum	*No profile required*	"Workflow for configuring the platepad" on page 136
PlateLoc Thermal Plate Sealer	"Creating a PlateLoc profile" on page 133	"Setting the PlateLoc device properties" on page 135
PlatePierce Seal Piercing Station	"Creating a PlatePierce profile" on page 139	"Setting the PlatePierce device properties" on page 140
Remp CSP	"Creating a Remp CSP profile" on page 474	"Setting the Remp CSP device properties" on page 476
Robo Cylinder Translator Robot	*Device Driver User Guide*	
Shelf, Filter Shelf, Reagent Shelf, Servo Shelf, Shaking Shelf, Standard Shelf, Tip Box Shelf, Tip Chute Shelf, Vacuum	"Workflow for configuring a VPrep shelf" on page 141	
SoftMax Pro	*Device Driver User Guide*	
Static Stack	*Device Driver User Guide*	
StoreX	*Device Driver User Guide*	
Teleshake, High-speed/ 1536 Teleshake, Standard	"Setting the Teleshake device properties" on page 481	

For this device	Look here to set up a profile...	And, look here to set device properties...
Thermo Labsystems Multiskan Ascent Reader	"Creating a Multiskan Ascent profile" on page 449	"Setting the Multiskan Ascent device properties" on page 450
Ultramark	"Setting the Ultramark device properties" on page 487	"Setting the Ultramark device properties" on page 487
Vacuum Station	*No profile required*	"Setting the vacuum station device properties" on page 145
VCode (3k) Bar Code Print and Apply Station	"Workflow for configuring the VCode" on page 146	
VCode (pre 2003) Bar Code Print and Apply Station	"Workflow for configuring the VCode" on page 146	
Vici Multiport Valve	"Creating a Vici Multiport Valve profile" on page 497	"Setting the Vici Multiport Valve device properties" on page 498
VPrep Precision Pipetting Station	"Workflow for configuring the VPrep" on page 148	
VSpin Integrated Microplate Centrifuge	"Workflow for configuring the VSpin" on page 151	
VSpin with Access2	"Workflow for configuring the VSpin with Access2" on page 154	
VStack Modular Plate Stacker	"Workflow for configuring the VStack" on page 157	
VStack Modular Plate Stacker (Old ST6 Style)	"Workflow for configuring the VStack" on page 157	
Waste	"Workflow for configuring Waste" on page 159	
Wellmate Dispenser	"Creating a WellMate profile" on page 505	"Setting the WellMate device properties" on page 506
Zeiss Plate::Vision Reader	*No profile required*	"Setting the Zeiss Plate::Vision reader device properties" on page 515

Related information

For information about...	See...
Setting generic device properties	"Setting the generic properties for a device" on page 112
Profiles	"About profiles" on page 103
The workflow that this procedure belongs to	"Workflow for setting up devices" on page 106

Setting the generic properties for a device

About this topic

This topic describes how to set the following device properties that devices have in common:

- ❑ General
- ❑ Teachpoint
- ❑ Bar code

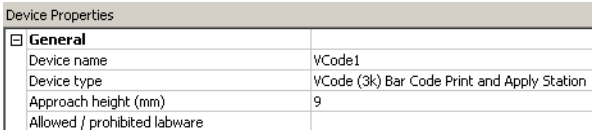
Properties specific for each device are found in the chapter for setting up and using the device.

Setting general properties

To set the general properties for a device:

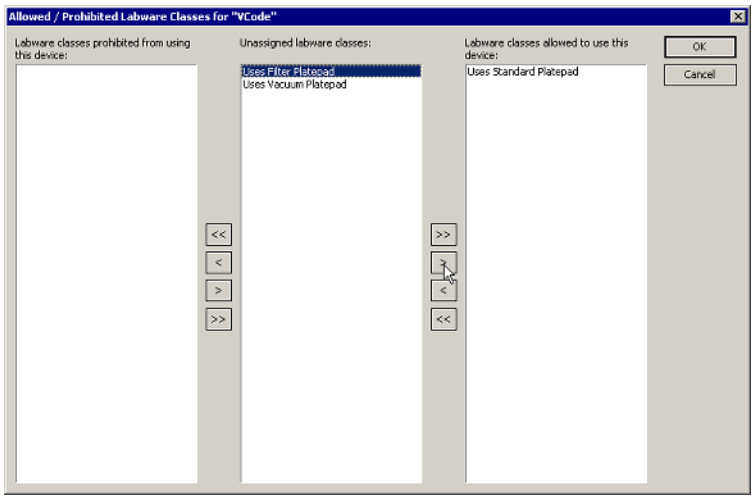
1. Add the device to the device manager.

   This sets the **Device name** and **Device type**.
2. Open the **Device Properties** page
3. Expand the **General Property** group.



4. If different from the default value of 9, enter the value (in millimeters) in the **Approach height** field.

   The approach height is the height to raise the robot gripper above the teachpoint when the robot moves the plate horizontally towards or away from it.
5. Assign allowable and non-allowable labware:
   a. Double-click in the field next to **Allowed/prohibited labware** to open the **Allowed/Prohibited Labware Classes for...** dialog box.



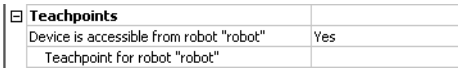
b. Move the labware classes as desired by selecting them and clicking one of the arrow buttons.

Setting teachpoints

Teachpoints are the coordinates in space that a robot travels to in order to interact with a device. Only the devices that are accessible by robots are able to have teachpoints.

To set the teachpoint properties:

1. Open the **Device Properties** page.
2. Expand the **Teachpoints** property group.



3. Double-click in the field next to **Device is accessible from robot *robot's name***.
4. Select **Yes**.

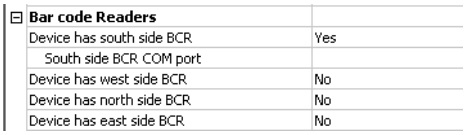
   A new property, **Teachpoint for robot *robot's name*** appears.
5. Double-click in the adjacent field and select the teachpoint from the list box.

Setting bar code

If your device has a bar code reader, indicate where the reader is located.

To set the bar code readers property:

1. Expand the **Bar Code Readers** property group.



Bar code Readers	
Device has south side BCR	Yes
South side BCR COM port	
Device has west side BCR	No
Device has north side BCR	No
Device has east side BCR	No

2. Double-clicking in the field next to the side that has the bar code reader.
3. Select **Yes**.

   A new property, ***direction*** **side BCR COM port** appears.
4. In the adjacent field, enter the COM port number to which the reader is connected.

Related information

For information about...	See...
Adding a device to the device manager	"Adding devices" on page 107
Opening the Device Properties page	"Adding devices" on page 107
Setting device-specific properties	"Creating a profile and setting the properties for a device" on page 108
Creating a profile	"Creating a profile and setting the properties for a device" on page 108
Setting up devices	"Workflow for setting up devices" on page 106
The workflow that this procedure belongs to	"Workflow for setting up devices" on page 106

Loading a device file

About this topic

This topic describes ways to load a device file.

Reason do to this

Every protocol needs a device file to run. When you open a protocol file the device file associated with it is automatically loaded.

To load a different device file use one of the these procedures.

Procedures

If you need to load a different device file for your current protocol, use one of the following methods.

Procedure 1: Load a device file from Windows

Use this method only if VWorks is not open.

To load a device file from Windows:

1. In Windows, navigate to the device file.
2. Double-click the file.

   VWorks is launched and the device file is loaded.

Procedure 2: Load a device file from VWorks

Use this method if VWorks is open.

To load a device file from within VWorks:

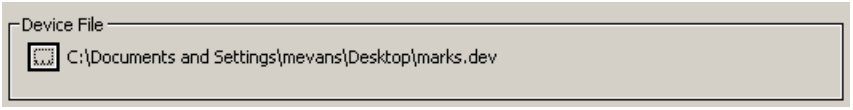
1. Navigate to **File** > **Device File**, click **Open,** and select your device file.

Procedure 3: Associate a device file with an existing protocol

Use this procedure to open a device file and associate it with an existing protocol.

To associate a device file with a protocol:

1. Click **Tools** and select **Protocol Options**.
2. In the **Protocol Options** tab of the dialog box, click the device file ellipsis button.



3. Navigate to the folder that contains the file to load.
4. Click **Open**.

Note: The file path displayed in the **Protocol Options** dialog box is updated if you save a protocol to a different folder.

7 Configuring Velocity11 devices

This chapter is for people with Administrator or Technician privileges. It explains what Velocity11 devices are and how to set them up.

About configuring Velocity11 devices

About this topic

This topic provides the following:

- ❑ A description of who needs to perform the tasks described here
- ❑ A definition of device in the context of VWorks
- ❑ An overview of how devices are configured
- ❑ The location of information associated with using all devices

Who should read this

All devices require an initial setup in VWorks. The information found in this chapter is written for Administrators or Technicians who have the responsibility of setting up or configuring new instruments.

About configuring devices

Configuring a device requires the following tasks:

- ❑ Adding the device to VWorks

  This tells VWorks that the instrument is a device.
- ❑ Creating a device profile

  This tells VWorks the communication pathway to the instrument.
- ❑ Setting the device properties

  This provides VWorks with additional information about the current configuration of the instrument. These settings are stored in the device file.

Where to find device-associated procedures

There are three types of procedures associated with each device:

- ❑ Configuring the device in VWorks
- ❑ Setting the device's tasks parameters
- ❑ Using the device's diagnostics software

The procedures for these types of tasks are in different locations, depending on how the device is controlled in VWorks. Use the tables below to locate the information for a specific device.

Configuring devices

The following table shows where to find procedures for configuring devices.

If the device is...	Then the procedure for configuring the device is found in...
A Velocity11 instrument not controlled by a driver plug-in	This chapter
A non-Velocity11 instrument not controlled by a driver plug-in	Its own chapter within this user guide
Any device controlled by a driver plug-in	*Device Driver User Guide*

Setting task parameters

The following table shows where to find procedures for setting task parameters for devices.

If the device is...	Then the procedure for setting task parameters is found in...
A Velocity11 instrument not controlled by a driver plug-in	“Setting task parameters for Velocity11 devices” on page 183
A non-Velocity11 instrument not controlled by a driver plug-in	Its own chapter within this user guide
Any device controlled by a driver plug-in	The *Device Driver User Guide*

Using device diagnostics

The following table shows where to find procedures for using diagnostics for a device.

If the device is...	Then the procedure for configuring the device is found in...
A Velocity11 instrument not controlled by a driver plug-in	The Velocity11 User Guide for that device
A non-Velocity11 instrument not controlled by a driver plug-in	Its own chapter within this user guide
Any device controlled by a driver plug-in	The *Device Driver User Guide*

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Specific device tasks	"Setting task parameters" on page 169
Users and accounts	"About user accounts and privileges" on page 370

Workflow for configuring the delid station

About this topic

The delid station is an instrument that uses a suction cup to remove a lid from a plate. The lid then can be replaced or dropped into the trash.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Setting the generic properties for a device" on page 112
3.	"Setting the delid station device properties" on page 121

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Setting Delid/Relid task parameters	"Setting Delid/Relid task parameters" on page 192

Setting the delid station device properties

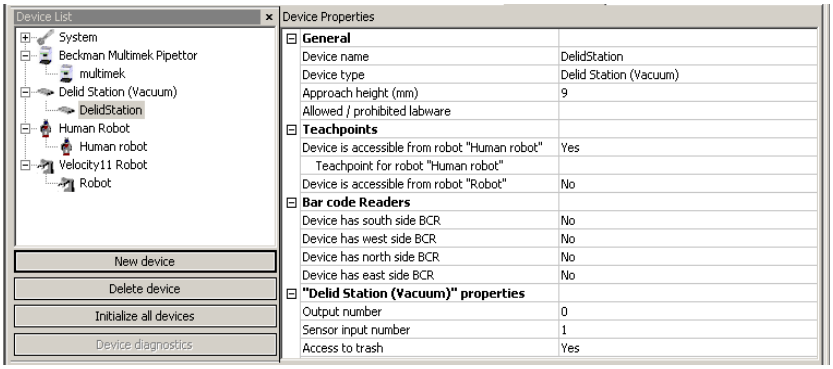
About this topic

This topic describes how to set the device properties for the delid station in VWorks.

Procedure

To set the delid station's device properties:

1. Open the Delid Station **Device Properties** page.
2. Set the Delid Station's generic device properties.



3. When the delid station is integrated on a BioCel, enter the **Delid Station (Vacuum) properties**.
   a. Expand the **Delid Station (Vacuum) properties** group.
   b. Double-click in the field next to **Output number** and enter the number the Bio I/O uses for the delid station.
   c. Double-click in the field next to **Sensor input number** and enter the number the Bio I/O uses for detecting a vacuum.
   d. Double-click in the field next to **Access to trash** and select **Yes** or **No**.

      Selecting **Yes** for this option indicates that the lids will be discarded and not replaced.
4. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
Opening Delid Station's device properties page	"Adding devices" on page 107
Setting Delid Station's generic properties	"Setting the generic properties for a device" on page 112
Setting up devices	"Workflow for setting up devices" on page 106
Setting Delid/Relid task parameters	"Setting Delid/Relid task parameters" on page 192
Workflow for configuring this device	"Workflow for configuring the delid station" on page 120

Workflow for configuring the human robot

About this topic

This topic describes how to use the human robot as a device in VWorks.

In VWorks software, you have the option of adding a human robot to the device file. Typically, you use the human robot when you are running a single instrument without a robot or when you are developing an assay with a few plates.

Human robot defined

The human robot is any person who is tasked with moving a piece of labware within a lab automation system. It is added to VWorks like any other device. When employed for use within a protocol, the protocol run pauses when encountering a human robot task. VWorks displays a message and continues after you indicate the task is completed.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Setting the human robot device properties" on page 123

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Using the human robot in a process	"Using the human robot in a protocol" on page 124

Setting the human robot device properties

About this topic

To use the human robot as a device, you need to make the instruments you want to use accessible to the robot in VWorks. This topic describes how to make an instrument accessible to manually move the plates to and from the human robot.

Before you start

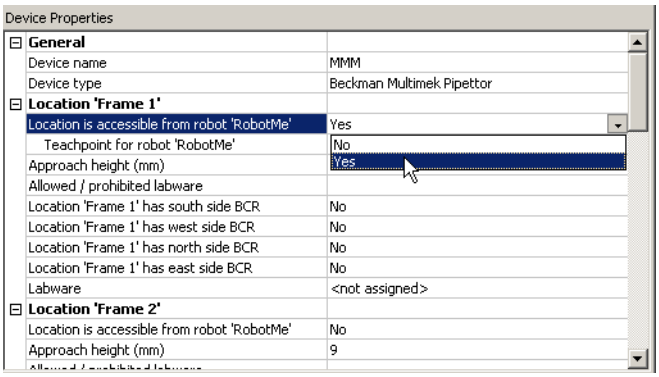
Before you start to configure the human robot, you need to add the human robot device to the device manager.

Procedure

The Device name and Device type are the only device properties that require setting for the human robot and these are completed when you add it to the device manager.

To make an instrument accessible to the human robot:

1. From the **Device List** in the **Device Manager**, select the instrument(s) you want to be accessible to the human robot.
2. In the **Device Properties** list, double-click in the field next to ***Device or location* is accessible from robot *robot's name*.**
3. Select **Yes**.



Related information

For information about...	See...
Adding the human robot as a device	"Adding devices" on page 107
Using the human robot in a process	"Using the human robot in a protocol" on page 124
The workflow that this procedure belongs to	"Workflow for configuring the human robot" on page 122

Using the human robot in a protocol

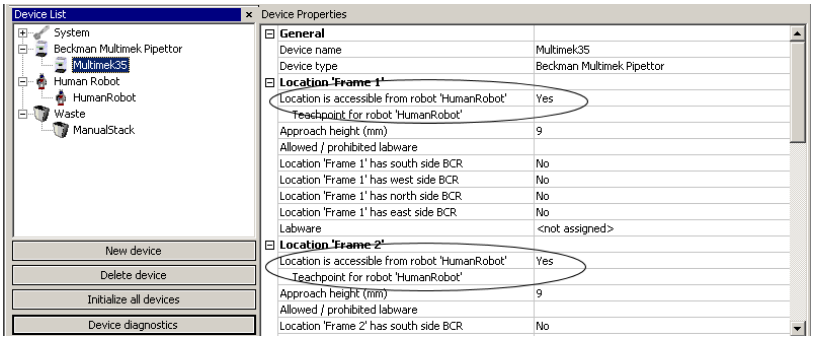
About this topic

This topic describes an example in which a human robot is used to move a set of plates to two locations on a Multimek instrument so it can aspirate and dispense. The plates are then removed from the Multimek.

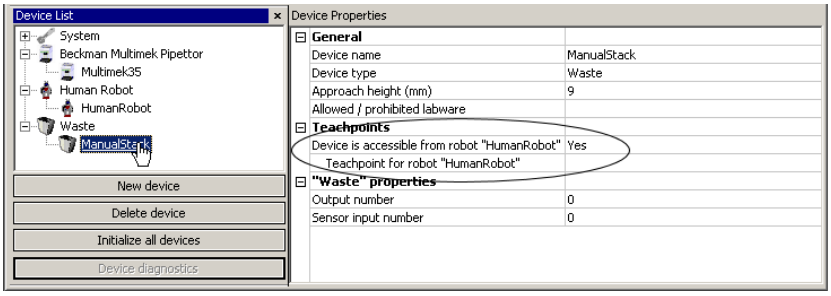
Procedures

To set up the devices:

1. In the **Device Manager**, ensure the Multimek locations you want to use are accessible by the human robot. In this case, it will be Frames that is, Locations 1 and 2.

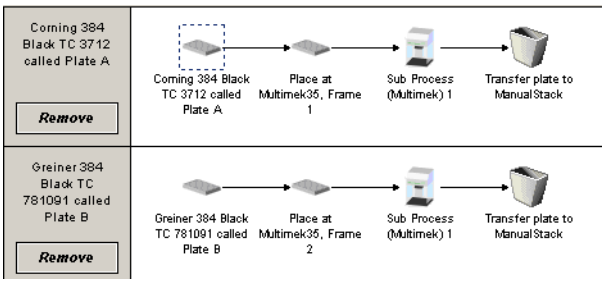


2. Add a **Waste** device to act as a "stack" to receive the finished plates. Make the stack accessible by the human robot.



To construct the protocol:

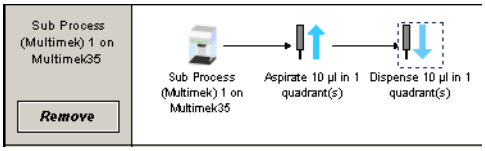
1. Create two processes in the **Protocol Editor** such as the ones in the following example:


Corning 384 Black TC 3712 called Plate A
Remove
Corning 384 Black TC 3712 called Plate A
Place at Multimek35, Frame 1
Sub Process (Multimek) 1
Transfer plate to ManualStack
Greiner 384 Black TC 781091 called Plate B
Remove
Greiner 384 Black TC 781091 called Plate B
Place at Multimek35, Frame 2
Sub Process (Multimek) 1
Transfer plate to ManualStack

   In the first process, Plate A is placed (by you, the human robot) in Frame 1 of the Multimek, undergoes the pipette process (aspirate), and then is transferred to the device named ManualStack (by you).

   In the second process, Plate B is placed (by you) in Frame 2 of the Multimek, undergoes the pipette process (dispense), and then is transferred to ManualStack (by you).

2. Create one pipette process in the **Pipette Process Editor** such as the one in the following example:


Sub Process (Multimek) 1 on Multimek35
Remove
Sub Process (Multimek) 1 on Multimek35
Aspirate 10 µl in 1 quadrant(s)
Dispense 10 µl in 1 quadrant(s)

   In this setup, you place plate A at Frame 1 of the Multimek and plate B at Frame 2. When you start the protocol, the aspirate and dispense pipette tasks are carried out. When the process is completed, you are prompted to move the plates from the Multimek to the device receptacle you labeled ManualStack.

Related information

For information about...	See...
Adding the human robot as a device	“Adding devices” on page 107
Using the human robot in a process	“Using the human robot in a protocol” on page 124
The workflow that this procedure belongs to	“Workflow for configuring the human robot” on page 122

Workflow for configuring the lid hotel

About this topic

The lid hotel is a device that stores plate lids. To use the lid hotel, one or more lid hotel storage bays must be associated with the lid hotel. This topic presents the workflow for configuring the lid hotel with a lid hotel storage bay in VWorks.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating a lid hotel profile" on page 127
3.	"Setting the generic properties for a device" on page 112
4.	"Setting the lid hotel device properties" on page 128
5.	"Setting the lid hotel storage bay device properties" on page 129

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Saving the device file	"Adding devices" on page 107
Using the lid hotel Diagnostics	"Using Lid Hotel Diagnostics" on page 130
Using the lid hotel tasks	"Setting Delid/Relid task parameters" on page 192

Creating a lid hotel profile

About this topic

This topic describes how to create a profile for the lid hotel in VWorks.

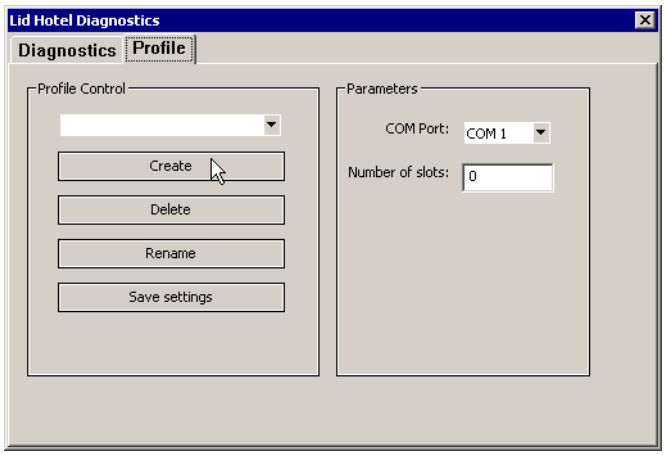
Before you start

Before you can create a profile, you must add the lid hotel to the device manager.

Procedure

To create a lid hotel profile:

1. In the **Lid Hotel Diagnostics** dialog box, click the **Profile** tab.



2. Click **Create**, enter a name for the lid hotel in the **New Profile** dialog box and click **OK**.
3. From the **COM Port** list box, select the port on the computer that you are using to connect the lid hotel.
4. In the **Number of slots** field, enter the number of storage bays that are on this lid hotel.
5. Click **Save settings** and then close the dialog box.

Related information

For information about...	See...
Adding a device	“Adding devices” on page 107
The next step	“Setting the generic properties for a device” on page 112
Open the diagnostics dialog box	“Opening diagnostics software” on page 105
The workflow this topic belongs to	“Workflow for configuring the lid hotel” on page 126
Using the lid hotel tasks	“Setting Delid/Relid task parameters” on page 192

Setting the lid hotel device properties

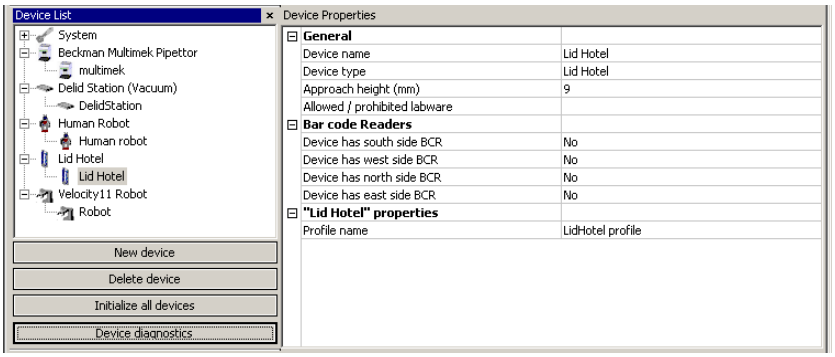
About this topic

This topic describes how to set the device properties for the lid hotel.

Procedure

To set the lid hotel's device properties:

1. Open the lid hotel's **Device Properties** page.
2. Set the lid hotel's generic properties.



3. Expand the **Lid Hotel** properties group.
4. If not already selected, double-click in the field adjacent to **Profile name** and choose a profile from the list box.
5. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
Opening Lid Hotel Diagnostics	"About diagnostics software" on page 104
Adding a device	"Adding devices" on page 107
The next step	"Setting the lid hotel storage bay device properties" on page 129
Setting lid hotel's generic properties	"Setting the generic properties for a device" on page 112
The workflow this topic belongs to	"Workflow for configuring the lid hotel" on page 126
Using the lid hotel tasks	"Setting Load, Unload, and Incubate at storage device task parameters" on page 198
Using Lid Hotel Diagnostics	"Using Lid Hotel Diagnostics" on page 130

Setting the lid hotel storage bay device properties

About this topic

This topic describes how to set the device properties for the lid hotel storage bay.

Every lid hotel has 10 bays (slots) available for storing lids. Each bay that you want to use needs to be added to the device manager and configured as a child of its parent lid hotel.

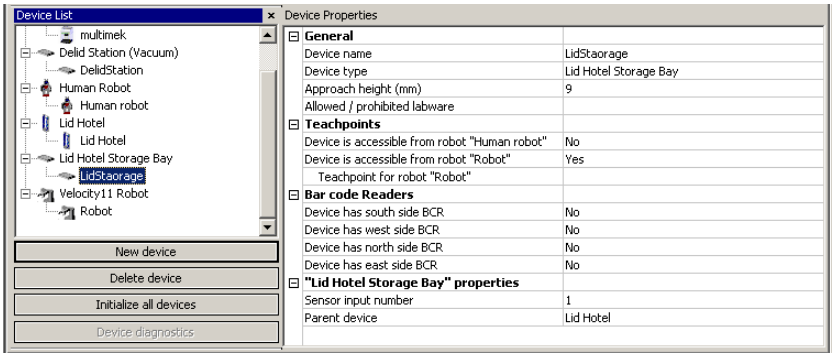
Before you start

Before you start setting the properties for the storage bays, you need to add them to the device manager.

Procedure

To set the lid hotel storage bay's device properties:

1. Open the **Device Properties** page.
2. Set the lid hotel storage bay's generic properties.



3. Expand the **Lid Hotel Storage Bay properties** group.
   a. In the field next to **Sensor input number**, enter the number the lid hotel uses to detect this storage bay.
   b. Double-click in the field next to **Parent device** and select the lid hotel with which the storage bay is associated.
4. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
Opening lid hotel storage bay device properties page	"Adding devices" on page 107
Adding a device	"Adding devices" on page 107
The workflow this topic belongs to	"Workflow for configuring the lid hotel" on page 126
Using the lid hotel tasks	"Setting Delid/Relid task parameters" on page 192
Using Lid Hotel Diagnostics	"Using Lid Hotel Diagnostics" on page 130

Using Lid Hotel Diagnostics

About this topic

This topic describes how to use the Lid Hotel Diagnostics to identify which positions contain lids and to manage profiles.

When to use

Typically, you use diagnostics to troubleshoot a communication problem between the software and storage bay. Use diagnostics when you want to verify that the software can detect the presence of a lid or when you need to adjust the storage bay's detection sensitivity level.

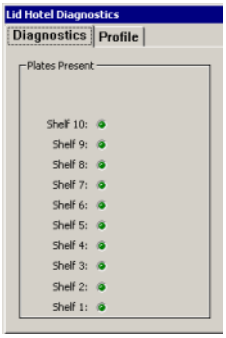
Use the profiles page when you want to change, add, or otherwise modify a profile.

Procedures

To view full lid hotel positions:

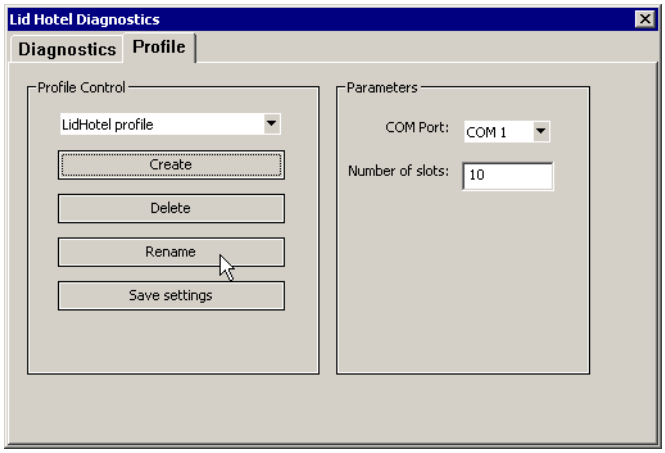
1. Open **Lid Hotel Diagnostics** page.

   The Diagnostics page shows an array of lights. The lights are green for positions that contain lids.



To manage Lid Hotel profiles:

1. Open the **Lid Hotel Device Diagnostics** dialog box and click the **Profile** tab.



2. To delete a profile or change a profile name, select the profile you want to manage from the list box and then click the appropriate command.
3. To modify the profile, select the profile from the list box, make the desired changes, and then click **Save settings**.

Related information

For information about...	See...
Adding a device	“Adding devices” on page 107
Opening lid hotel Diagnostics	“Opening diagnostics software” on page 105
Creating a profile for the lid hotel	“Creating a lid hotel profile” on page 127
The workflow this topic belongs to	“Workflow for configuring the lid hotel” on page 126
Using the lid hotel tasks	“Setting Delid/Relid task parameters” on page 192

Workflow for configuring the PlateLoc

About this topic

The PlateLoc is an instrument that seals plates using heat. This topic describes how to set up the PlateLoc in VWorks. For more information about the PlateLoc, see the *PlateLoc User Guide*.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating a PlateLoc profile" on page 133
3.	"Setting the generic properties for a device" on page 112
4.	"Setting the PlateLoc device properties" on page 135

Related information

For information about...	See...
Setting up a device	"Workflow for setting up devices" on page 106
Using the PlateLoc task	"Setting Seal task parameters" on page 212
Using the PlateLoc Diagnostics	*PlateLoc User Guide*

Creating a PlateLoc profile

About this topic

This topic describes how to create a profile for the PlateLoc in VWorks.

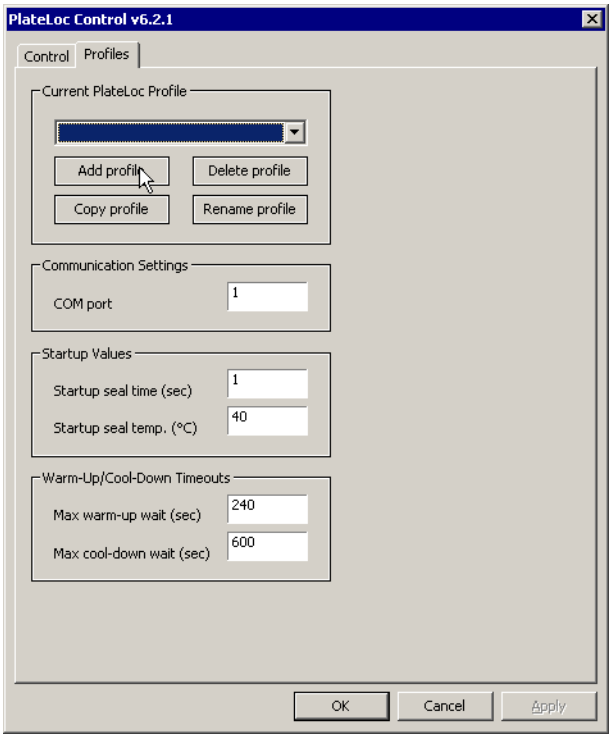
Before you start

Before you start to create a profile, you must add the PlateLoc instrument to the device manager.

Procedure

To create a PlateLoc profile:

1. In the **PlateLoc Diagnostics** dialog box, click the **Profile** tab.



2. Click **Add profile**, enter a name for the PlateLoc instrument in the **Add Profile** dialog box and click **OK**.
3. In the **Communications** group box, enter the **COM Port** you are using to connect the PlateLoc with the controlling computer.
4. Enter the **Startup Values** settings.
   a. In the **Startup seal time** field, enter the amount of time (in seconds) you want the default seal time to be.
   b. In the **Startup seal temp** field, enter the default temperature (in degrees centigrade) you want the sealer be at when it seals a plate.
5. Enter the **Warm-up/Cool-Down Timeouts**.

a. Enter the maximal amount of time (in seconds) you want to wait for the sealer to reach temperature in the **Max warm-up wait** field.

b. Enter the maximal amount of time (in seconds) you want to wait for the sealer to cool in between sealings in the **Max cool-down wait** field.

6. Click **OK**.

Related information

For information about...	See...
Adding a device	"Adding devices" on page 107
The next step	"Opening diagnostics software" on page 105
Opening PlateLoc Diagnostics	"Opening diagnostics software" on page 105
The workflow this topic belongs to	"Workflow for configuring the PlateLoc" on page 132
Using the PlateLoc task	"Setting Seal task parameters" on page 212
Using the PlateLoc Diagnostics	*PlateLoc User Guide*

Setting the PlateLoc device properties

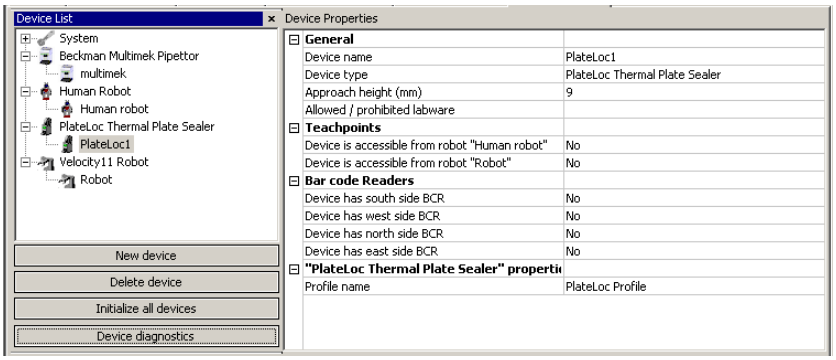
About this topic

This topic describes how to set the PlateLoc's device properties.

Procedure

To set the PlateLoc device properties:

1. Open the **Device Properties** page.
2. Set the PlateLoc's generic properties.



3. Expand the **PlateLoc Thermal Plate Sealer properties** group.
4. If not already selected, double-click in the field adjacent to **Profile name** and choose a profile from the list box.
5. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
Opening PlateLoc's Diagnostics	"Opening diagnostics software" on page 105
Adding a device	"Adding devices" on page 107
Saving the device file	"Adding devices" on page 107
The workflow this topic belongs to	"Workflow for configuring the PlateLoc" on page 132
Creating a PlateLoc profile	"Creating a PlateLoc profile" on page 133
Using the PlateLoc task	"Setting Seal task parameters" on page 212
Using PlateLoc Diagnostics	*PlateLoc User Guide*

Workflow for configuring the platepad

About this topic

This topic presents the workflow for configuring a platepad in VWorks.

A platepad is a solid surface designed to hold a single microplate. There are three types of Velocity11 platepads which are described in the table below.

Platepad type	Function/description
Standard	Pad that holds a microplate.
Vacuum	Pad that holds a microplate and at the same time applies a vacuum to the bottom of the plate to keep the plate flat for operations performed on the plate.
Filter	Pad whose face is indented so that it can accommodate a filter plate type.

Workflow

Step	Topic
1.	“Adding devices” on page 107
2.	“Setting the generic properties for a device” on page 112
3.	“Setting the platepad device properties” on page 137

Related information

For information about...	See...
Saving the device file	“Adding devices” on page 107
Using the platepad tasks	❑ “Setting Mount/Dismount task parameters” on page 200 ❑ “Setting Place Plate task parameters” on page 204

Setting the platepad device properties

About this topic

This topic describes how to set the platepad device properties.

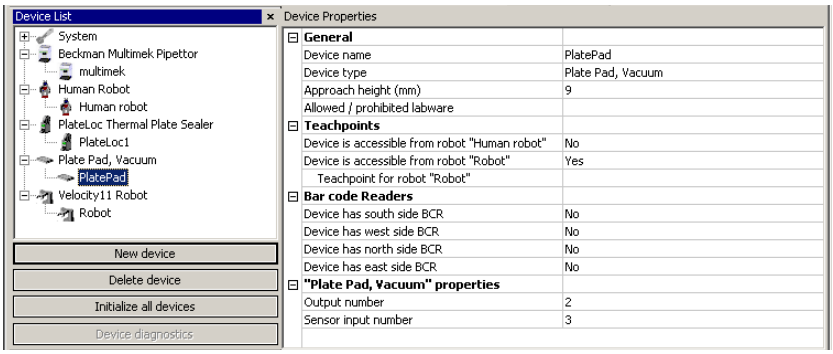
Before you start

Before you can set the device properties, you must add the platepad to the device manager.

Procedure

To set the device properties for a standard, vacuum, or filter platepad:

1. Open the **Device Properties** page.
2. Set the platepad's generic properties.



3. Expand the "**Plate Pad, *Type*" properties** group.
4. If you are configuring a Vacuum platepad on a BioCel, enter its properties.

   Note: Vacuum platepads can only be used with BioCels.

   a. In the **Output number** field, enter the number that the Bio I/O uses to turn on the vacuum.

   b. In the **Sensor input number** field, enter the number that the Bio I/O uses to detect the presence of a vacuum.
5. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
Opening platepad's device properties page	"Adding devices" on page 107
Adding a device	"Adding devices" on page 107
Saving the device file	"Adding devices" on page 107
The workflow this topic belongs to	"Workflow for configuring the platepad" on page 136
Using the platepad tasks	❑ "Setting Place Plate task parameters" on page 204 ❑ "Setting Mount/Dismount task parameters" on page 200

Workflow for configuring the PlatePierce

About this topic

This topic describes how to set up the PlatePierce in VWorks.

The PlatePierce is an instrument that pierces sealed plates to allow liquids to be aspirated from and dispensed into the wells.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating a PlatePierce profile" on page 139
3.	"Setting the generic properties for a device" on page 112
4.	"Setting the PlatePierce device properties" on page 140

Related information

For information about...	See...
Setting up a device	"Workflow for setting up devices" on page 106
Using the PlatePierce task	"Setting Pierce task parameters" on page 203
Using PlatePierce Diagnostics	*PlatePierce User Guide*

Creating a PlatePierce profile

About this topic

This topic describes how to create a profile for the PlatePierce in VWorks.

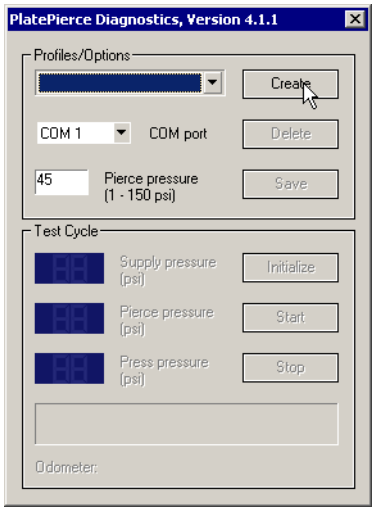
Before you start

Before you can create a profile, you must add the PlatePierce to the device manager.

Procedure

To create a PlatePierce profile:

1. In the **PlatePierce Diagnostics** dialog box, click **Create**.



2. Enter a name for the PlatePierce in the **Create New Profile** dialog box and click **OK**.
3. From the list box, select the **COM port** that connects the PlatePierce to the controlling computer.
4. In the **Pierce pressure** field, enter the pressure you want the PlatePierce to use when piercing the plate seal.

   This number depends on what kind of seal was used.
5. Click **Save** and then close the dialog box.

Related information

For information about...	See...
Opening PlatePierce Diagnostics	"Opening diagnostics software" on page 105
The next step	"Setting the generic properties for a device" on page 112
The workflow this topic belongs to	"Workflow for configuring the PlatePierce" on page 138
Adding the device	"Adding devices" on page 107
Using the PlatePierce task	"Setting Pierce task parameters" on page 203
Using PlatePierce Diagnostics	*PlatePierce User Guide*
Different seal types	*PlatePierce User Guide*

Setting the PlatePierce device properties

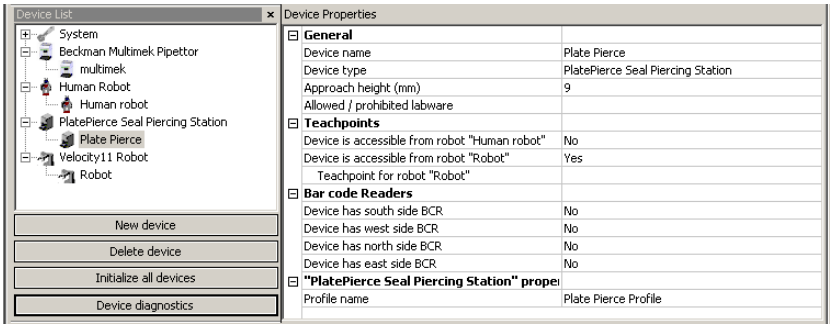
About this topic

This topic describes how to set the PlatePierce device properties.

Procedure

To set the PlatePierce device properties:

1. Open the **Device Properties** page.
2. Set the PlatePierce's generic properties.



3. Expand the **PlatePierce Seal Piercing Station properties** group.
4. If not already selected, double-click in the field adjacent to **Profile name** and choose a profile from the list box.
5. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this topic belongs to	"Workflow for configuring the PlatePierce" on page 138
Opening PlatePierce's device properties page	"Opening diagnostics software" on page 105
Adding the device	"Adding devices" on page 107
Saving the device file	"Adding devices" on page 107
Using the PlatePierce task	"Setting Pierce task parameters" on page 203
Using PlatePierce Diagnostics	*PlatePierce User Guide*

Workflow for configuring a VPrep shelf

About this topic

This topic presents the workflow for configuring a VPrep shelf.

Each VPrep shelf must be added as a device and then configured to be used to hold tips, plates, and reservoirs.

There are eight types of VPrep shelves that can be added and configured in VWorks.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Setting the generic properties for a device" on page 112
3.	"Setting VPrep shelf device properties" on page 142

When to use

Use this procedure when configuring a VPrep initially, as well as when a new type of shelf device is used in a protocol for the first time.

Related information

For information about...	See...
A description of VPrep shelves	*VPrep User Guide*
Setting up a device	"Workflow for setting up devices" on page 106
Saving the device file	"Adding devices" on page 107
Pipette tasks	"Setting pipette task parameters" on page 173

Setting VPrep shelf device properties

About this topic

Because different shelf types are used for different purposes, they may have different properties that need configuring. This topic describes how to set the properties for all the shelf types.

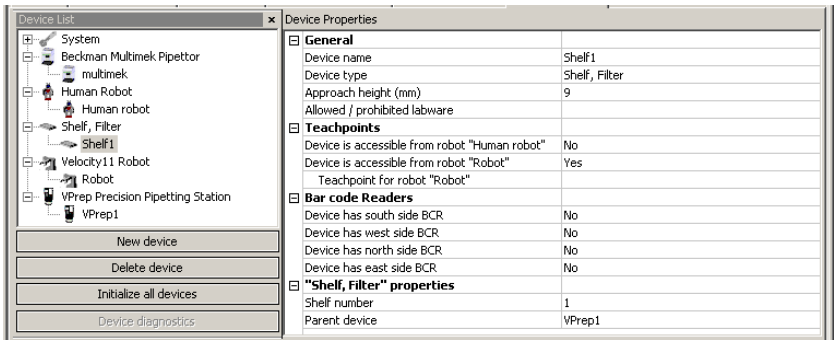
Before you start

Before you can set the device properties, you need to have the VPrep device properties configured and to add the VPrep shelf to the device manager.

Procedure

To set the VPrep shelf device properties:

1. Open the **Device Properties** page.
2. Set the VPrep shelf's generic properties.



3. Expand the **Shelf, *Type* properties** group.
   a. Double-click in the field next to **Shelf number** and enter the number of the shelf you are configuring.

      Each shelf type is associated with specific numbers. For example, reagent shelves have odd numbers, with shelf 1 being at the top left.

b. Double-click in the field next to **Parent device** and select the VPrep associated with the shelf.

c. If you are configuring a **Shaking** shelf-type, double-click in the field next to **COM port** and select the port from the list that connects the shelf to the controlling computer.

d. If you are configuring a **Reagent**, **Tip box**, or **Tip chute** shelf-type, double-click on the field next to **Labware** and select the labware from the list that is being used with the shelf.

Related information

For information about...	See...
Opening VPrep shelf's device properties page	"Adding devices" on page 107
The workflow this topic belongs to	"Workflow for configuring a VPrep shelf" on page 141
A description of VPrep shelves	*VPrep User Guide*
Setting up a device	"Workflow for setting up devices" on page 106
VPrep Diagnostics	*VPrep User Guide*
Saving the device file	"Adding devices" on page 107
Pipette tasks	"Setting pipette task parameters" on page 173

Workflow for configuring a vacuum station

About this topic

This topic presents a workflow for configuring a vacuum station in VWorks.

The vacuum station is a device that can hold filter plates and applies a vacuum for filtration.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Setting the generic properties for a device" on page 112
3.	"Setting the vacuum station device properties" on page 145

Related information

For information about...	See...
Setting up a device	"Workflow for setting up devices" on page 106
Saving the device file	"Adding devices" on page 107
Vacuum station tasks	"Setting Vacuum task parameters" on page 215

Setting the vacuum station device properties

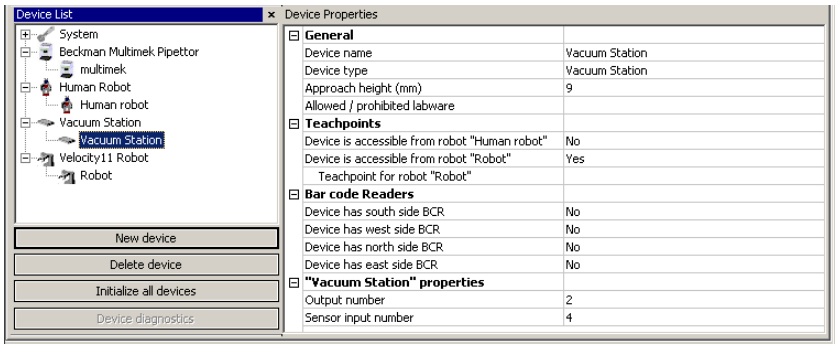
About this topic

This topic describes how to set the vacuum station's device properties.

Procedure

To set the vacuum station device properties:

1. Open the **Device Properties** page.
2. Set the vacuum station's generic properties.



3. Expand the **Vacuum Station properties** group.

   This instrument can only be used with a BioCel.

   a. Double-click in the field next to **Output number** and enter the number the Bio I/O uses to initiate the vacuum.

   b. Double-click in the field next to **Sensor input number** and select the number that the Bio I/O uses to detect the presence of a vacuum.

4. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this topic belongs to	"Workflow for configuring a vacuum station" on page 144
Opening vacuum station's device properties page	"Adding devices" on page 107
Setting up a device	"Workflow for setting up devices" on page 106
Saving the device file	"Adding devices" on page 107
Vacuum station tasks	"Setting Vacuum task parameters" on page 215

Workflow for configuring the VCode

About this topic

This topic presents a workflow for configuring the VCode in VWorks.

The VCode Bar Code Print and Apply Station prints bar code labels and applies them to any side of a microplate.

The VCode can operate as a stand-alone instrument or can be configured to be used in an automation system that runs VWorks.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating a VCode profile" in the *VCode User Guide*
3.	"Setting the generic properties for a device" on page 112
4.	"Setting the VCode device properties" on page 147

Related information

For information about...	See...
Setting up a device	"Workflow for setting up devices" on page 106
Saving the device file	"Adding devices" on page 107
VCode tasks	"About setting Apply Label task parameters" on page 184
Using VCode Diagnostics	*VCode User Guide*

Setting the VCode device properties

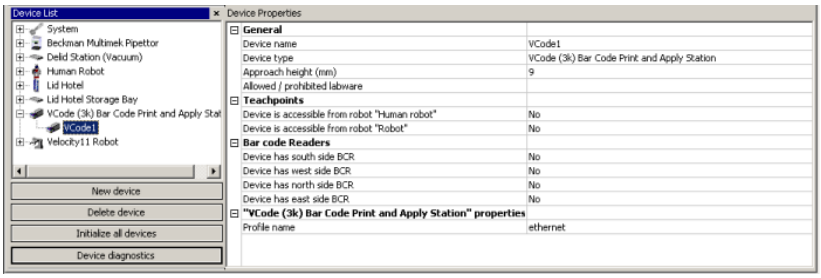
About this topic

This topic describes how to set the VCode device properties.

Procedure

To set the VCode device properties:

1. Open the **Device Properties** page.
2. Set the VCode generic properties.



3. Expand the **VCode Bar Code Print and Apply properties** group.
   a. If you have a **VCode 3K Bar Code Print and Apply Station**, double-click in the field next to the **Profile name** and select the profile.
   b. If you have a **VCode (pre 2003) Bar Code Print and Apply Station**, double-click in the field next to **COM port** and select the port your VCode is using to connect to the controlling computer.
4. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
Opening VCode device properties page	"Adding devices" on page 107
The workflow this topic belongs to	"Workflow for configuring the VCode" on page 146
Setting up a device	"Workflow for setting up devices" on page 106
Saving the device file	"Adding devices" on page 107
VCode tasks	"About setting Apply Label task parameters" on page 184
Creating and managing profiles	*VCode User Guide*
Using VCode Diagnostics	*VCode User Guide*

Workflow for configuring the VPrep

About this topic

This topic presents the workflow for configuring the VPrep in VWorks.

The VPrep is an automated pipetting station that can be used as a stand-alone instrument or configured to function within a lab automation system using VWorks.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating a VPrep profile" on page 149
3.	"Setting the generic properties for a device" on page 112
4.	"Setting the VPrep device properties" on page 150

Related information

For information about...	See...
Setting up a device	"Workflow for setting up devices" on page 106
Saving the device file	"Adding devices" on page 107
VPrep tasks	"Setting pipette task parameters" on page 173
Using VPrep Diagnostics	*VPrep User Guide*

Creating a VPrep profile

About this topic

This topic describes how to create a profile for the VPrep.

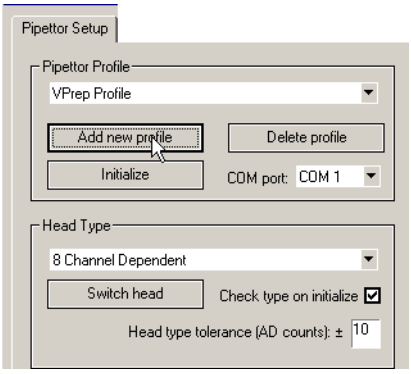
Before you start

Before you can create a profile, you need to add the VPrep to the device manager.

Procedure

To create a VPrep profile:

1. In the **VPrep Diagnostics** dialog box, click the **Pipettor Setup** tab.



2. Click **Add new profile**, enter a name in the **New Profile** dialog box and click **OK**.
3. From the **COM port** list box, select the port your VPrep is using to connect to the controlling computer.
4. In the **Head Type** group box, select the head you are using from the list box.
5. Click **OK** to close the dialog box and save the changes.

Related information

For information about...	See...
The next step	"Setting the VPrep device properties" on page 150
The workflow this topic belongs to	"Workflow for configuring the VPrep" on page 148
Opening VPrep Diagnostics	"Opening diagnostics software" on page 105
Profile settings	*VPrep User Guide*
Setting up a device	"Workflow for setting up devices" on page 106
Saving the device file	"Adding devices" on page 107
VPrep tasks	"Setting pipette task parameters" on page 173
Using VPrep Diagnostics	*VPrep User Guide*

Setting the VPrep device properties

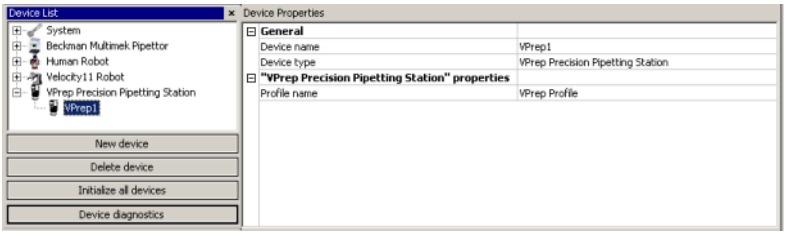
About this topic

This topic describes how to set the VPrep device properties.

Procedure

To set the VPrep device properties:

1. Open the **Device Properties** page.
2. Set the VPrep's generic properties.



3. Expand the **VPrep properties** group.
4. Double-click in the field next to **Profile name** and select the correct profile from the list.
5. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this topic belongs to	"Workflow for configuring the VPrep" on page 148
Opening VPrep's device properties page	"Adding devices" on page 107
Setting up a device	"Workflow for setting up devices" on page 106
Saving the device file	"Adding devices" on page 107
VPrep tasks	"Setting pipette task parameters" on page 173
Using VPrep Diagnostics	*VPrep User Guide*

Workflow for configuring the VSpin

About this topic

This topic presents the workflow for configuring the VSpin in VWorks.

The VSpin is a microplate centrifuge that is intended to be integrated with a robotic lab automation system using VWorks. It is not designed for manual use, and using it in this manner is not recommended.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating a VSpin profile" on page 152
3.	"Setting the generic properties for a device" on page 112
4.	"Setting VSpin device properties" on page 153

Related information

For information about...	See...
Setting up a device	"Workflow for setting up devices" on page 106
Saving the device file	"Adding devices" on page 107
VSpin tasks	"Setting Centrifuge task parameters" on page 190
Using VSpin Diagnostics	*VSpin User Guide*

Creating a VSpin profile

About this topic

This topic describes how to create a profile for the VSpin.

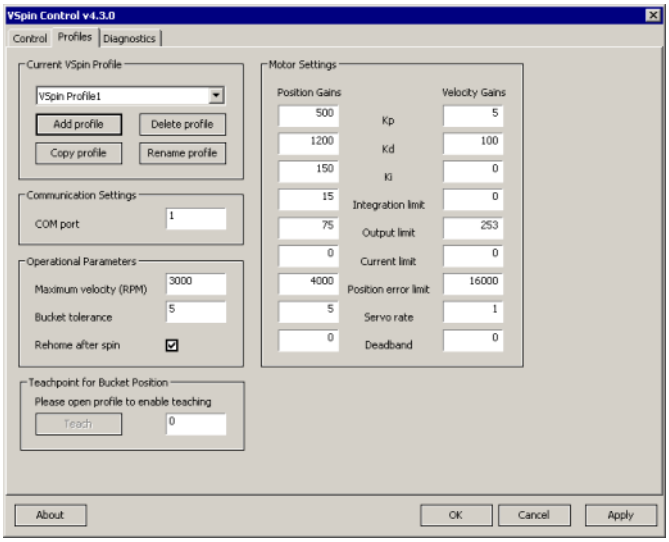
Before you start

Before you can create a profile, you must add the VSpin to the device manager.

Procedure

To create a VSpin profile:

1. In the **VSpin Control** dialog box, click the **Profile** tab.



2. Click **Add Profile**, enter a name for the profile in the **Add Profile** dialog box and click **OK**.
3. Enter the appropriate communication settings for the profile.

   !! IMPORTANT !! Do not change the motor settings.
4. Click **OK**.

Related information

For information about...	See...
The next step	"Setting VSpin device properties" on page 153
The workflow this topic belongs to	"Workflow for configuring the VSpin" on page 151
Opening VSpin's control dialog box	"Opening diagnostics software" on page 105
VSpin profile settings and management	*VSpin User Guide*
Setting up a device	"Workflow for setting up devices" on page 106
Managing profiles and settings	*VSpin User Guide*
Using VSpin Diagnostics	*VSpin User Guide*

Setting VSpin device properties

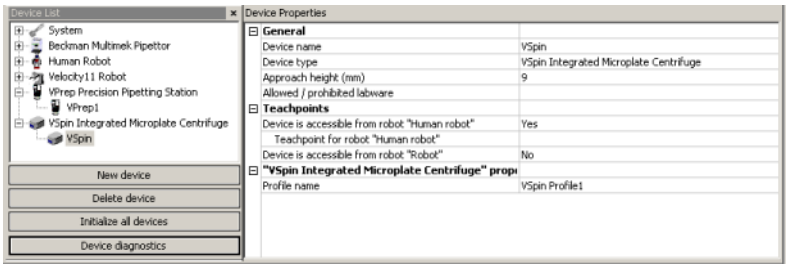
About this topic

This topic describes how to set the VSpin device properties.

Procedure

To set the VSpin device properties:

1. Open the **Device Properties** page.
2. Set the VSpin's generic properties.



3. Expand the **VSpin Integrated Microfuge...properties** group.
4. Double-click in the field next to **Profile name** and select the correct profile from the list.
5. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this topic belongs to	"Workflow for configuring the VSpin" on page 151
Opening VSpin's device properties page	"Adding devices" on page 107
Setting up a device	"Workflow for setting up devices" on page 106
Managing profiles and settings	*VSpin User Guide*
Using VSpin Diagnostics	*VSpin User Guide*

Workflow for configuring the VSpin with Access2

About this topic

This topic presents the workflow for configuring the Access2 in VWorks.

The Access2 is a VSpin accessory for crane-style robots that cannot deliver plates directly to the VSpin. A crane-style robot delivers a plate to the Access2, which then places it inside the VSpin.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating a VSpin with Access2 profile" on page 155
3.	"Setting the generic properties for a device" on page 112
4.	"Setting the VSpin with Access2 device properties" on page 156

Related information

For information about...	See...
Setting up a device	"Workflow for setting up devices" on page 106
Managing profiles and settings	*Access2 User Guide*
VSpin with Access2 tasks	"Setting VSpin with Access2 task parameters" on page 216
Using VSpin with Access2 Diagnostics	*Access2 User Guide*

Creating a VSpin with Access2 profile

About this topic

This topic describes how to create a profile for the VSpin with Access2 using VWorks. For information about profile settings and managing profiles, see the *VSpin User Guide*.

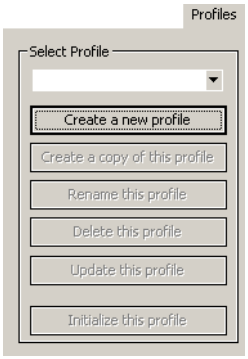
Before you start

Before you can create a profile, you must add the VSpin with Access2 to the device manager.

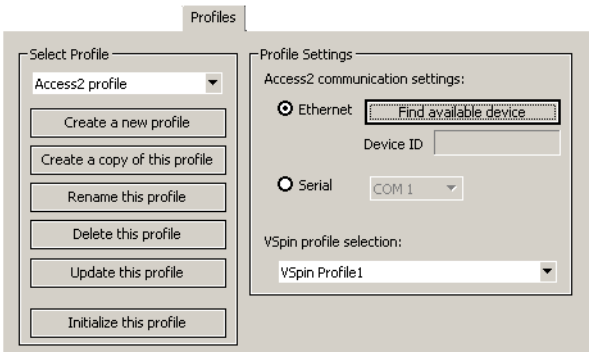
Procedure

To create a VSpin with Access2 profile:

1. In the **VSpinAccess2 Diagnostics** dialog box, click the **Profiles** tab.



2. In the **Select Profile** group box, click **Create a new profile**, enter a name for the profile in the **New Profile** dialog box and click **OK**.



3. Select the desired **Profile Settings**.
4. Click **Update this profile** to save the settings.
5. Close the dialog box.

Related information

For information about...	See...
The next step	"Setting the VSpin with Access2 device properties" on page 156
The workflow this topic belongs to	"Workflow for configuring the VSpin with Access2" on page 154
Opening Access2 Diagnostics	"Opening diagnostics software" on page 105
Setting up a device	"Workflow for setting up devices" on page 106
Managing profiles and settings	*Access2 User Guide*
VSpin with Access2 tasks	"Setting VSpin with Access2 task parameters" on page 216
Using VSpin with Access2 Diagnostics	*Access2 User Guide*

Setting the VSpin with Access2 device properties

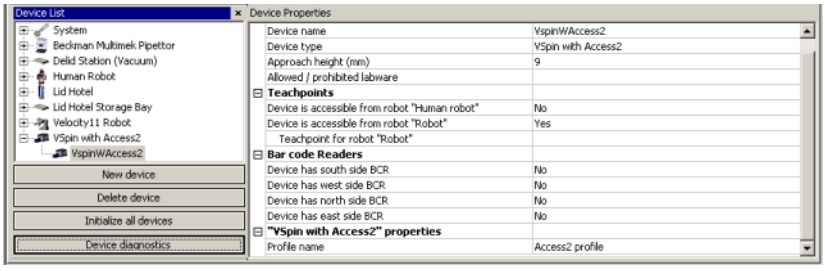
About this topic

This topic describes how to set the VSpin with Access2 device properties.

Procedure

To set the VSpin with Access2 device properties:

1. Open the **Device Properties** page.
2. Set the Access2 generic properties.



3. Expand the **VSpin with Access2 properties** group.
4. Double-click in the field next to **Profile name** and select the correct profile from the list.
5. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this topic belongs to	"Workflow for configuring the VSpin with Access2" on page 154
Opening Access2 device properties page	"Adding devices" on page 107
Setting up a device	"Workflow for setting up devices" on page 106
Managing profiles and settings	*Access2 User Guide*
Using VSpin with Access2 Diagnostics	*Access2 User Guide*
VSpin with Access2 tasks	"Setting VSpin with Access2 task parameters" on page 216

Workflow for configuring the VStack

About this topic

This topic presents the workflow for configuring the VStack in VWorks.

The VStack is a microplate stacker used in lab automation systems to dispense and receive plates. It holds deepwell and shallow-well plates, pin tools, tipboxes, and lids. Typically, several VStacks are used in a single lab automation system.

Workflow

Step	Topic
1.	"Adding devices" on page 107.
2.	Identify the VStack on the network. See the *VStack User Guide* for a procedure.
3.	"Setting the generic properties for a device" on page 112.
4.	"Setting the VStack device properties" on page 158.

Related information

For information about...	See...
Setting up a device	"Workflow for setting up devices" on page 106
VStack tasks	"Setting Downstack and Upstack task parameters" on page 193
Using VStack Diagnostics	*VStack User Guide*

Setting the VStack device properties

About this topic

This topic describes how to set the VStack device properties.

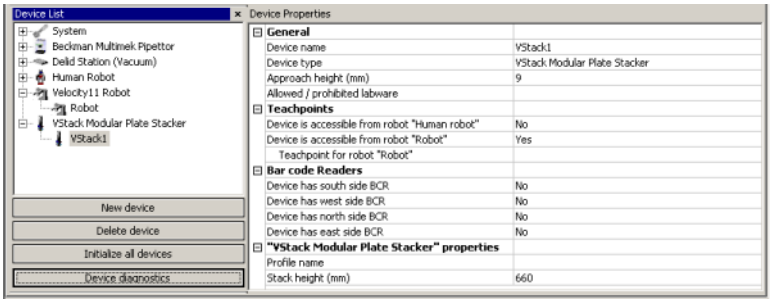
Before you start

Before you start, you need to add the VStack to the device manager and verify communications.

Procedure

To set the VStack device properties:

1. Open the **Device Properties** page.
2. Set VStack's generic properties.



3. Expand the **VStack Modular Plate Stacker properties** group.
4. Double-click in the field next to **Profile name** and select the correct profile from the list.
5. If you have an old style VStack, in the field next to **Device number**, enter the number of the VStack assigned to it.
6. In the field next to **Stack height**, enter the height of the stack (in millimeters).
7. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this procedure belongs to	"Workflow for configuring the VStack" on page 157
Opening VStack's device properties page	"Setting the generic properties for a device" on page 112
Verifying communications	*VStack User Guide*
Setting up a device	"Workflow for setting up devices" on page 106
VStack tasks	"Setting Downstack and Upstack task parameters" on page 193
Using VStack Diagnostics	*VStack User Guide*

Workflow for configuring Waste

About this topic

This topic presents the workflow for configuring Waste in VWorks.

Waste is a location (teachpoint) where the robot releases the labware that it has in its grippers. A receptacle for trash is typically positioned under this teachpoint.

Because it is accessed by a teachpoint of the robot, it is treated as a device.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Setting the generic properties for a device" on page 112
3.	"Setting the Waste device properties" on page 160

Related information

For information about...	See...
Setting up a device	"Workflow for setting up devices" on page 106
Setting output and input I/0	*BioCel User Guide*

Setting the Waste device properties

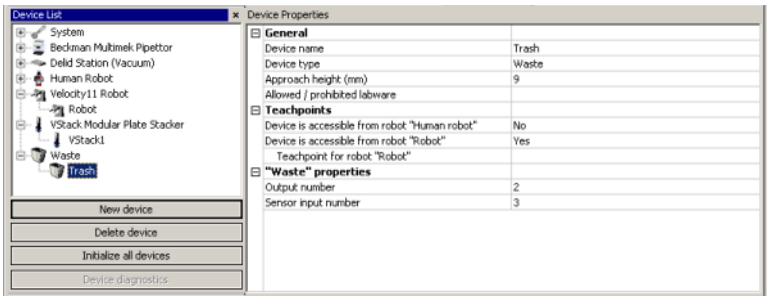
About this topic

This topic describes how to set the device properties for Waste.

Procedure

To set the Waste device properties:

1. Open the **Device Properties** page.
2. Set Waste's generic properties.



3. If you are using a Waste device with a BioCel expand the **Waste properties** group.
   a. If you do not have an environmental chamber separating the waste from the robotic system, enter zeros in the **Output number** and **Sensor input number** fields.
   b. If you do have an environmental chamber separating the waste from the robotic system, double-click in the **Output number** and enter the number the Bio I/O uses to open the chamber door.

      Double-click in the field next to the **Sensor input number** and select the number the Bio I/O uses to detect the opening of the chamber door.
4. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
Opening Waste's device properties page	"Adding devices" on page 107
The workflow this procedure belongs to	"Workflow for configuring Waste" on page 159
Setting up a device	"Workflow for setting up devices" on page 106
Setting output and input I/0	*BioCel User Guide*

Creating a protocol: basics

8

This chapter is for people with Administrator or Technician privileges. It describes the basic process of creating a protocol. To fully understand how to create a protocol, you also need to read the information in the following chapters:

- "Setting task parameters for Velocity11 devices" on page 183
- "Setting VPrep pipette task parameters" on page 221
- "Creating a protocol: advanced topics" on page 267

Before reading this chapter you should:

- Have installed VWorks ("VWorks installation" on page 81) and set up your devices ("Setting up devices" on page 101)
- Be familiar with the concepts presented in the chapter "Performing a run" on page 59

This chapter is not a tutorial on writing protocols—it provides the basic reference information you need to write protocols.

About protocol files

About this topic

This topic provides an overview of the protocol file format.

File format

Protocols are created in the drag-and-drop protocol editor. When they are saved, the information is written to a file in XML format. In XML, the elements indicate the protocol's properties, and text within the markup tags gives the properties' values.

Most users create and edit protocols in the protocol editor. Advanced users have the option of creating and editing protocols directly in XML. The XML files can also be useful for troubleshooting because you can, for example, see which device file is associated with the protocol.

XML example

A protocol file viewed in an XML editor that color-codes text is shown below.

```
<?xml version="1.0" encoding="ASCII"?>
<Velocity11 file="Protocol_Data" md5sum="751d03b4f669f58547085c6da8dd1706" version="1.0">
    <Device_File File_Name="C:\Documents and Settings\mevans\Desktop\marks.dev"/>
    <Description Description=""/>
    <Process Multiplier="1" Processes_To_Spawn="1" Tip_Box_Process="0">
        <Bar_Code_File_Info>
            <south Bar_Code_File=""/>
            <west Bar_Code_File=""/>
            <north Bar_Code_File=""/>
            <east Bar_Code_File=""/>
        </Bar_Code_File_Info>
        <Plate Has_Lid="0" Labware="Costar 96-well plate" Name="Plate 1" Sealed="0">
            <Bar_Code_Info>
                <south Bar_Code_File="No bar code" Has_Bar_Code="1"/>
                <west Bar_Code_File="No bar code" Has_Bar_Code="0"/>
                <north Bar_Code_File="No bar code" Has_Bar_Code="0"/>
                <east Bar_Code_File="No bar code" Has_Bar_Code="0"/>
            </Bar_Code_Info>
        </Plate>
        <Tasks>
            <Task0 Description="Downstack from stacker2" Device="" Enable_Timed_Release="0" Icon="0"
Object_Type="DownstackPlate" Release_Time_MS="10000">
                <Stackers_To_Use>
                    <Stacker Name="stacker2"/>
                </Stackers_To_Use>
            </Task0>
            <Task1 Description="Bar code plate" Device="vcode1" Icon="1" Object_Type="BarcodePlate" Type="BarcodePlate">
                <south Bar_Code_Names="0" Base="10" File_Name="" Format="1" Increment_Characters="3" Lookup_Key="2"
Max_Verification_Attempts="0" Number_Of_Fields="2" Plugin_Name="" Preprinted_Side="0" Print_Label="1"
Starting_Increment="1" Verify_Barcodes="0">
                    <Fields>
```

You can also open a protocol file in any browser that contains an XML parser, such as Internet Explorer, version 4 or later.

XML Schema

To create and edit protocols directly in XML, you need to have the XML schema that defines the logical rules of a VWorks protocol. If you want the schema, please contact the Velocity11 Service Center.

Workflow for creating a protocol

About this topic

This topic outlines the procedures you need to follow to create a protocol in VWorks.

Workflow

The general workflow for creating a basic protocol is:

Step	Topic
1.	"Creating a new protocol" on page 164
2.	"Setting up a plate icon" on page 164
3.	"Adding a task or pipette task" on page 168
4.	"Setting task parameters" on page 169
5.	"Setting pipette task parameters" on page 173 (Applies only to VPrep and Multimek devices)
6.	*Optional:* "Using breakpoints" on page 176
7.	*Optional:* "Disabling tasks" on page 178
8.	"Compiling protocols" on page 179
9.	"Simulating a run" on page 181

Creating a new protocol

About this topic

If you have a protocol file open and you want to create a new protocol, follow this procedure.

If you do not have a protocol file in VWorks, you can skip this procedure.

Procedure

To create a new protocol:

1. Click **File** and select **Protocol File > New**.

Related information

For information about...	See...
The workflow that this procedure belongs to	"Workflow for creating a protocol" on page 163
What to do next	"About setting the number of simultaneous plates" on page 167

Setting up a plate icon

About this topic

This topic describes setting up a plate icon. This is the first step in creating a protocol process.

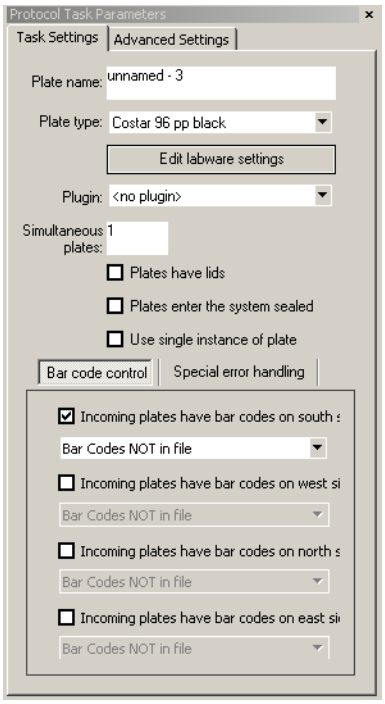
Procedure

To set up a plate icon:

1. Click the **Protocol Editor** tab.

   This page is referred to as the protocol editor.
2. Click **Add**.

   A plate icon appears in the protocol editor window.
3. If the **Task Parameters** toolbar is not showing, select **View > Toolbars > Protocol Task Parameters**.

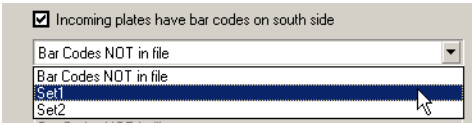


4. In the **Task Settings** page of the **Protocol Task Parameters** toolbar:
   a. Type a name for the plate in the **Plate name** text box.
   b. In the **Plate type** list box, select the type of plate you want to use.
   c. If you want to add or modify a plate definition, click **Edit labware settings** to open the labware editor.
   d. If you are using a plug-in, select it from the **Plug-in** list box.

      If the plug-in is not available for selection, it is because the *file_name*.dll file is not in the plug-ins folder in the same folder as the VWorks executable.
   e. In the **Simultaneous plates** text box, type the maximum number of plates of this type that the system is allowed to operate on at any given time.
   f. If the plates entering the system have lids, select the **Plates have lids** check box.

      Note: This option is only available if the plate you selected is capable of using a lid, as defined in the labware editor.
   g. If the sample plates in the protocol have seals when they are loaded onto the system, check the **Plates enter the system sealed** check box.
   h. If you have only one instance of a plate type and want it to be used repeatedly, select the **Use single instance of plate** check box. For example, you may have one source plate from which you want to repeatedly aspirate a given volume and dispense it into a different receiving plates.

5. In the **Bar code control** sub-page:
   a. If the incoming plates have bar codes, select the appropriate **Incoming plates have bar codes...** check box.
   b. If you want to check the bar codes on the incoming plates against a series of bar codes in a bar code input file, select the name of the bar code series you want to use.



   For more information about bar codes input from file, see Related information.
6. In the **Special error handling** sub-page:
   a. Select one or more devices that you want to use as quarantine stations and click **Add**.

      The device names are moved to the bottom quarantine list.

      A quarantine station is a place that plates will be placed if the plate has a bar code mismatch error.
   b. Check, or leave clear, the **Quarantine plate after process completed** check box, based on the following descriptions.

      If the check box is left clear, a plate that gives a bar code misread error is immediately moved to a quarantine station and a new plate takes the place of the quarantined plate in the processing sequence.

      If the check box is selected, plates that give a bar code misread are processed as normal, but are then moved to quarantine instead of moving to the final destination specified in the protocol.

Related information

For information about...	See...
How to set the number of simultaneous plates	"About setting the number of simultaneous plates" on page 167
The workflow that this procedure belongs to	"Workflow for creating a protocol" on page 163
What to do next	"Adding a task or pipette task" on page 168
Plug-ins	"About the FileReader plug-in" on page 298
Reading bar codes from file	"Using bar code input files" on page 293

About setting the number of simultaneous plates

About this topic

This topic provides some guidance on how to set the number of simultaneous plates in the Task Settings page. (See "Setting up a plate icon" on page 164.)

The number of simultaneous plates is the maximum number of plates belonging to a single process that are in the system at one time.

Plates that are in the system could be in the robot gripper, on platepads, VPrep shelves, plate hotels, and so on. Simultaneous plates do not include counterweight plates.

Selecting the number

In general, the number of simultaneous plates to select for a plate icon depends on how many:

- ❑ Tasks there are in the protocol.

  In general, one simultaneous plate can be used for every task in the protocol. This is because, in general, each task uses one plate position. As an example, a protocol with three tasks can have three plates on the table at once. There are exceptions to this, though, such as cases where the same plate position is used for more than one of the tasks, and when a VPrep is used. Several plates can be positioned on a VPrep at the same time.

- ❑ Positions there are in the system that will incubate plates.

  If your lab automation system has five plate hotels and each stores ten plates, you can run more simultaneous plates than if your system has only six platepads.

- ❑ Plates there are in a restack task.

  If the protocol includes a restack task, the number of simultaneous plates must be equal to, or greater than, the number of plates in the restack task.

If the number of simultaneous plates is set too high, the protocol may be slowed down because the robot will move around to avoid a deadlock. In cases where too many plates are in the system and there is no way to move plates around further, this can result in a deadlock–at which point the protocol stops.

If the number of simultaneous plates is set too low, the time for the protocol run could be extended. Optimizing the number of simultaneous plates is therefore critical for maximizing efficiency.

A typical protocol has 5–30 simultaneous plates, but it could be many more than that. A safe number to start with when testing a new protocol is 1–2. The protocol should be run in simulation to optimize the number of simultaneous plates.

Related information

For information about...	See...
The Task Settings page where the number of simultaneous plates is entered	"Setting up a plate icon" on page 164

Adding a task or pipette task

About this topic

After you have set up a plate icon for a process, you can start adding tasks and pipette tasks. This topic describes how to do this.

Adding a task

You must always add a task to a process before you can define its task parameters.

To add a task:

1. If the **Protocol Tasks** toolbar is not showing, click **View** and then select **Toolbars** > **Protocol Tasks**.
2. There are various ways to add tasks to the protocol:
   - Click on a task icon and drag it from the task list to the protocol editor window until a vertical, dashed line appears.
   - Double-click the icon.
   - Copy (or cut) and paste task icons in the protocol.

Deleting a task

To delete a task:

1. In a protocol editor, select a task that is in a protocol process.
2. Press the DELETE key on the keyboard.
3. Click **Yes** in the **Delete Task** dialog box to delete the task.

Moving tasks

When editing a protocol, drag-and-drop or use cut-and-paste commands to move tasks and groups of tasks.

To move tasks in a protocol:

1. In a protocol editor, select a task or a group of tasks in a protocol process.
2. Do one of the following:
   - Drag and drop the tasks to a new location in the protocol.
   - Use the **Cut** or **Copy** and **Paste** commands on the **Edit** menu to move the tasks.

Related information

For information about...	See...
The workflow that this procedure belongs to	"Workflow for creating a protocol" on page 163
What to do next	❑ "Setting task parameters" on page 169 ❑ "Setting pipette task parameters" on page 173

Setting task parameters

About this topic

There are many types of task that can be used in a protocol. The tasks you can choose to use depend on the instruments you have in your system. You need to set parameters for each task in your protocol. Each task has its own set of parameters.

This topic tells you where to find parameter information for each type of task.

Device, task, and parameters list

To set task parameters:

1. Refer to this table to find the information you need to set the task parameters for the devices and tasks you are using.

For this device (or devices)...	And this task...	Find parameter information here...
All devices	Place Plate	"Setting Place Plate task parameters" on page 204
	Signal	"Setting Waitfor task and Signal task parameters" on page 217
	User Message	"Setting User Message task parameters" on page 213
	Waitfor	"Setting Waitfor task and Signal task parameters" on page 217
Bio-Tek Washer	Bio-Tek Washer	"Setting the Bio-Tek task parameters" on page 392
Beckman Multimek Pipettor	Sub Process (Multimek)	*Device Driver User Guide*

For this device (or devices)...	And this task...	Find parameter information here...
Cavro Pump Network	Aspirate (Cavro Pump) Dispense (Cavro Pump) Load (Cavro Pump) Prime (Cavro Pump) Transfer (Cavro Pump)	*Device Driver User Guide*
Delid Station (Vacuum)	Delid	"Setting Delid/Relid task parameters" on page 192
	Relid	
FlexiSpense	FlexiSpense	"Setting FlexiSpense task parameters" on page 422
FlexiSpense-M	FlexiSpense-M	"Setting FlexiSpense-M task parameters" on page 431
FLIPR Tetra	Sub Process (FLIPR Tetra)	*Device Driver User Guide*
Genetix Aliquot	Aliquot	"Setting the AliQuot task parameters" on page 384
Genetix QFill	QFill	"Setting QFill task parameters" on page 469
Human Robot	*No tasks*	–
Innovadyne Nanodrop	Nanodrop	"Setting Nanodrop task parameters" on page 462
Labcyte Echo550	Echo550	"Setting Echo 550 task parameters" on page 404
Labcyte Echo550 Destination Stage		
Labcyte Echo550 Source Stage		
Lid Hotel	*No tasks*	–
Lid Hotel Storage Bay	Delid Relid	"Setting Delid/Relid task parameters" on page 192
Multidrop	Multidrop	"Setting MultiDrop task parameters" on page 441
SoftMax Pro Reader	Perform read plate with Softmax Reader	*Device Driver User Guide*
Peak Robotics KiNEDx Robot	*No tasks*	–

For this device (or devices)...	And this task...	Find parameter information here...
PerkinElmer Envision Reader	Envision	"Setting Envision task parameters" on page 416
PerkinElmer PlateStak	Downstack Upstack	"Setting Downstack and Upstack task parameters" on page 193
PlateHub	Load Unload Incubate at plate storage device	*Not currently available;* contact the Velocity11 Service Center for information
Plate Pad, Filter Plate Plate Pad, Standard Plate Pad, Vacuum	Dismount	"Setting Mount/Dismount task parameters" on page 200
	Incubate	"Setting Incubate task parameters" on page 195
	Mount	"Setting Mount/Dismount task parameters" on page 200
PlateLoc Thermal Plate Sealer	Seal	"Setting Seal task parameters" on page 212
PlatePierce Seal Piercing Station	Pierce	"Setting Pierce task parameters" on page 203
Remp CSP	Remp CSP	No task parameters
Robo Cylinder Translator Robot	*No tasks*	–
Shelf, Filter	*No tasks*	–
Shelf, Reagent	*No tasks*	–
Shelf, Servo	*No tasks*	–
Shelf, Shaking	*No tasks*	–
Shelf, Standard	*No tasks*	–
Shelf, Tip Box	*No tasks*	–
Shelf, Tip Chute	*No tasks*	–
Shelf, Vacuum	*No tasks*	–
Shuttle Robot	*No tasks*	–
StoreX Incubator	Load Unload Incubate	"Setting Load, Unload, and Incubate at storage device task parameters" on page 198

For this device (or devices)...	And this task...	Find parameter information here...
StoreX IO Pad	*No tasks*	–
Teleshake, High-speed/1536	Teleshake (High Speed)	"Setting Teleshake task parameters" on page 482
Teleshake, Standard	Teleshake	"Setting Teleshake task parameters" on page 482
Thermo Labsystems Multiskan Ascent Reader	Multiskan Ascent	"Setting Multiskan Ascent task parameters" on page 452
Ultramark	Ultramark	"Setting Ultramark task parameters" on page 489
Vacuum Station	Vacuum	"Setting Vacuum task parameters" on page 215
VCode (3k) Bar Code Print and Apply Station	Apply Label	"About setting Apply Label task parameters" on page 184
VCode (pre 2003) Bar Code Print and Apply Station	Apply Label	"About setting Apply Label task parameters" on page 184
Velocity11 Robot	*No tasks*	–
Vici Multiport Valve	Vici Valve	"Setting the Vici Multiport Valve task parameters" on page 499
VPrep Precision Pipetting Station	Pipette Process	See "Setting VPrep pipette task parameters" on page 221
VSpin Integrated Microplate Centrifuge	Centrifuge	"Setting Centrifuge task parameters" on page 190
VSpin with Access2	VSpin with Access2	"Setting VSpin with Access2 task parameters" on page 216
VStack Modular Plate Stacker VStack Modular Plate Stacker (Old ST6 Style)	Downstack Upstack	"Setting Downstack and Upstack task parameters" on page 193
Waste	Waste	*No adjustable settings*

For this device (or devices)...	And this task...	Find parameter information here...
Weigh Pad	*No tasks*	–
Wellmate Dispenser	Wellmate	"Setting WellMate task parameters" on page 507
Zeiss Plate::Vision Reader	Zeiss	"Setting Zeiss Plate::Vision reader task parameters" on page 516

Related information

For information about...	See...
The workflow that this procedure belongs to	"Workflow for creating a protocol" on page 163
What to do next	"Setting pipette task parameters" on page 173
Pre- and post-protocol task parameters	"Setting up a pre- or post-protocol process" on page 268

Setting pipette task parameters

About this topic

This topic tells you where to find information about parameters for each type of pipette task.

Pipette device, task, and parameters list

To set pipette task parameters:

1. Refer to this table to find the information you need to set the pipette task parameters for the device and tasks you are using.

For this pipette device...	And this pipette task...	Find parameter information here...
All pipettor devices	Loop	"Setting Loop pipette task parameters" on page 248
	Change Instance	"Setting Change Instance pipette task parameters" on page 230

For this pipette device...	And this pipette task...	Find parameter information here...
Beckman Multimek Pipettor	Aspirate (Multimek)	*Device Driver User Guide*
	Aspirate (Simple) (Multimek)	
	Deliver Tip Tray (Multimek)	
	Dispense (Multimek)	
	Empty Tips (Multimek)	
	Empty Tips (Simple) (Multimek)	
	Mix (Multimek)	
	Move to Plate/Frame (Multimek)	
	Move X-Y Axes (Multimek)	
	Move Z Axis (Absolute) (Multimek)	
	Move Z Axis (Relative) (Multimek)	
	Remove Tip Tray (Multimek)	
	Remove Tip Tray (Multimek)	
	Run Macro (Multimek)	
VPrep Precision Pipetting Station	Aspirate	"Setting Aspirate pipette task parameters" on page 228
	Change Tips	"Setting Change Tips pipette task parameters" on page 232
	Dispense	"Setting Dispense pipette task parameters" on page 235
	Fill Plate	"Setting Fill Plate pipette task parameters" on page 239
	Mix	"Setting Mix pipette task parameters" on page 249

For this pipette device...	And this pipette task...	Find parameter information here...
VPrep Precision Pipetting Station *(cont'd)*	Pump Reagent	"Setting Pump Reagent pipette task parameters" on page 252
	Serial Dilution	"Setting Serial Dilution task parameters" on page 253
	Wash Tips	"Setting Wash Tips pipette task parameters" on page 262

Related information

For information about...	See...
Task parameters	"Setting task parameters" on page 169
Pre- and post-protocol task parameters	"Setting up a pre- or post-protocol process" on page 268
The workflow that this procedure belongs to	"Workflow for creating a protocol" on page 163
What to do next	"Using breakpoints" on page 176

Using breakpoints

About this topic

This topic describes when and how to use breakpoints. A breakpoint is a point in the protocol where you want the system to pause operation.

When to use breakpoints

Breakpoints are useful in situations where you are troubleshooting a specific device. Breakpoints pause the protocol before it carries out the task that has a breakpoint.

For example, if you want to ensure that you are aspirating from a suitable height in the plate, you may choose to insert a breakpoint at the aspirate step to ensure that you can watch the pipettor as it carries out that operation. Breakpoints can be added during a protocol run, and the run stops when that task is reached in the next cycle.

About running a protocol that contains breakpoints

A breakpoint stops the protocol every time it reaches that particular step in that cycle. When you simulate or run a protocol that contains breakpoints, you are presented with some dialog boxes that are special for breakpoints.

The Debugger dialog box has four buttons:

- Clear all breakpoints

  This allows the protocol to continue. The protocol will no longer stop at that step for the rest of the run.

- Single step

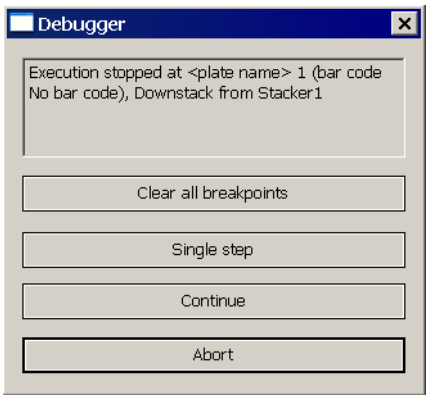
  This advances the protocol one task at a time.

- Continue

  This advances the protocol until the next breakpoint.

- Abort

  This ends the protocol.



Setting a breakpoint

This procedure describes how to add a breakpoint to your protocol. You can add as many breakpoints as you want to a protocol.

To set a breakpoint:

1. Right-click the task icon where you want the breakpoint.
2. Select **Set breakpoint** from the menu that appears.

   A red dot appears on the icon to indicate that it is a breakpoint.

Removing breakpoints

You can remove breakpoints individually or you can remove all breakpoints at once.

To remove a breakpoint:

1. Right-click the task icon where there is breakpoint.
2. Select **Remove breakpoint** from the menu that appears.

To remove all breakpoints in a protocol:

1. Do one of the following:
   - Select **Tools** > **Clear All Breakpoints**.
   - Right-click any task icon, and select **Remove all breakpoints.**

Related information

For information about...	See...
The workflow that this procedure belongs to	“Workflow for creating a protocol” on page 163
What to do next	“Disabling tasks” on page 178
Simulating a run	“Simulating a run” on page 181

Disabling tasks

About this topic

After you have placed the tasks in your protocol, you may want to disable some of the tasks as you test the protocol.

You can disable some of the tasks that you have included in a protocol. The advantage of disabling a task instead of deleting it is that a disabled task is easily re-enabled.

This topic describes how to disable and then enable tasks in a protocol.

When to use disable tasks

Here are two scenarios where you might want to skip tasks in a protocol:

- ❑ While a protocol is running.

  A device is not working properly and you want to avoid stopping and restarting the run. VWorks avoids moving plates to that location and executing the disabled task.

- ❑ A specific task is not required at the start of the protocol run.

  For example, a protocol may be run continuously with a Seal task. You may choose not to seal plates in that particular run. Disabling the task allows you to do this without having to create and save a new protocol. Disabling the task also allows you to retain task parameters that may be more complex (such as, for an Apply Label task) that would be erased if you deleted the task.

Disabling a task

To disable a task:

1. Right-click the task that you want to disable.
2. Select **Disable task** from the menu that appears.

   A red circle and strike line appears on the icon to indicate that it is a disabled task.

   This means that the task will be ignored when the protocol is run.

Enabling tasks

You can enable tasks individually or you can enable all tasks at once.

To enable a task:

1. Right-click the task icon which is disabled.
2. Select **Enable task** from the menu that appears.

To enable all tasks in a protocol:

1. Do one of the following:
   - Select **Tools** > **Enable All Tasks**.
   - Right-click any task icon and select **Enable all tasks.**

Related information

For information about...	See...
The workflow that this procedure belongs to	"Workflow for creating a protocol" on page 163
What to do next	"Compiling protocols" on page 179

Compiling protocols

About this topic

This topic describes how to compile a protocol.

Compiling a protocol

To compile a protocol:

1. Click **Compile**.

Errors are reported in the Log toolbar.

Note: Whenever you start a protocol, VWorks automatically compiles it and checks for errors.

Related information

For information about...	See...
The workflow that this procedure belongs to	"Workflow for creating a protocol" on page 163
Saving the protocol	"Saving protocols" on page 180

Saving protocols

About this topic

This topic describes how to save a protocol and how to add notes to a protocol.

Saving a protocol

To save a protocol you must be logged on with an Administrator or Technician user account.

!! IMPORTANT !! When you edit a protocol, the changes take effect immediately. However, unless you explicitly save the protocol, the changes are lost when you exit VWorks.

To save a protocol:

1. Navigate to **File > Protocol File**, click **Save** or **Save As**.

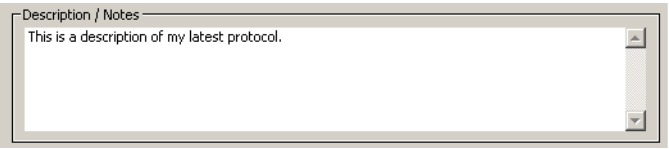
Adding notes about the protocol

Before you save the protocol, you may want to add notes to it.

You can add a description of your protocol to remind yourself of its features or for VWorks operators to review before performing a run.

To add notes about your protocol:

1. Click **Tools** and select **Protocol Options**.
2. Type your notes into the **Description/Notes** text box.



Note: When you open a new protocol, its associated description replaces the description of the previous protocol.

Related information

For information about...	See...
The workflow that this procedure belongs to	“Workflow for creating a protocol” on page 163
What to do next	“Simulating a run” on page 181

Simulating a run

About this topic

This topic provides suggestions on how to check for errors in a protocol after it is compiled.

Simulating the run

After making sure that there are no compiler errors in the protocol, you can check for other types of problems by running the protocol through the simulator. The simulator allows you to confirm that steps are done and sequenced correctly and to find problems such as:

- ❑ Deadlocks
- ❑ Periods of inefficiency, when the robot is not being used
- ❑ Plates spending different times at critical steps when they should be run under identical conditions
- ❑ A number of simultaneous plates that is too high or too low

The simulator does not move any instruments. It performs a "virtual run" based on the estimated task execution times displayed for each task. You can change the execution times for tasks to make the simulation more accurate for your protocol.

One approach you can use for testing is the following:

1. Run the simulator with the default task execution times and the same number of plates expected for a run to identify deadlocks and rate limiting tasks.
2. Resolve any major problems with the protocol.
3. Perform a real, dry run with a plate.
4. Use the times recorded in the Log toolbar to edit the task execution times for each task.
5. Run the simulator with the more accurate task execution times.
6. Fine-tune the protocol based on the results of the simulation.

Running the simulator

To run the simulator:

1. Turn the **Simulator** on by clicking the **Simulation is off** button on the toolbar.

   The button changes to read **Simulation is on**.

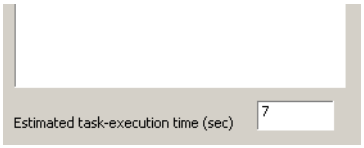
2. Click the **Start** button to run the protocol.

Changing execution times

Not all tasks have adjustable execution times, but for those that do, follow this procedure to change them.

To change the default task execution times:

1. Select a task in a protocol sequence.
2. In the **Protocol Task Parameters** toolbar, click the **Advanced Settings** tab.
3. At the bottom of the toolbar, enter a new value for the **Estimated task-execution time**.



Related information

For information about...	See...
Breakpoints in runs	“Using breakpoints” on page 176
The workflow that this procedure belongs to	“Workflow for creating a protocol” on page 163

Setting task parameters for Velocity11 devices

9

Tasks are used to execute protocols. When a task is added to a protocol process, you need to set parameters for that task. Setting task parameters are typically done when constructing or modifying a protocol.

This chapter describes how to set the task parameters for Velocity11 devices. For setting the task parameters for other companies' devices, see "Setting task parameters" on page 169.

About setting Apply Label task parameters

About this topic

This topic provides some information about the Apply Label task to help you make choices about bar code labelling.

Apply Label task defined

The Apply Label task uses a VCode to print a bar code label and apply it to a plate.

Bar code labelling decisions

Before you add an Apply Label task to a protocol, consider your record-keeping and automation needs. For example:

- ❑ Do you need each bar code label to be unique within a run, but not from run to run?
- ❑ Do you need each bar code label to be unique across all runs?
- ❑ Will you be using a Laboratory Information Management System (LIMS) for barcoding information and record-keeping?
- ❑ What human-readable fields do you want to include on the label?
- ❑ Do you want to use a bar code input file?
- ❑ Do you want to use a bar code data file?

Bar code format

When setting Apply Label task parameters you need to select a bar code format, which specifies the type, number, properties, and location of fields that are printed on bar code labels.

Some formats are provided with the VCode, but you can define others according to your needs. Each format is identified by a number, which you enter when setting up a Bar Code task.

Related information

For information about...	See...
Setting bar code task parameters	"Setting Apply Label task parameters" on page 185
Combining bar code modifiers	"About combining bar code modifiers" on page 188
Configuring a VCode as a device	"Workflow for configuring the VCode" on page 146
Bar code formats and symbologies	*VCode User Guide*
FileReader plug-in	"About the FileReader plug-in" on page 298

Setting Apply Label task parameters

About this topic

This topic describes how to set the parameters for the Apply Label task.

Before you start

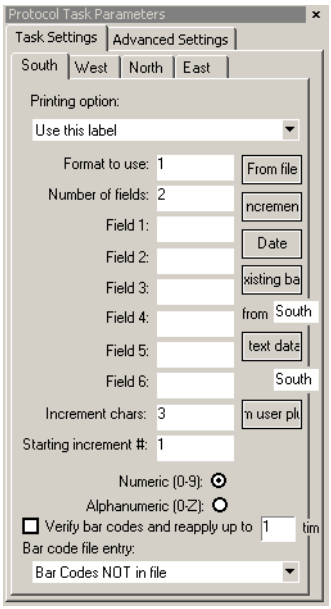
Before working with Apply Label tasks, read the *VCode User Guide* to learn about bar codes and label formats.

Procedure

To set Apply Label task parameters:

1. Add the **Apply Label** task to a protocol process.
2. In the **Protocol Task Parameters** toolbar, click a tab corresponding to a side of the plate.

   The options are **South**, **West**, **North,** and **East**.



3. Select one of the options in the **Printing Option** list box.

If...	Then...
You do not want to place a label on this side of the plate	Select **No Label** and return to step 2.
You want to define a bar code label and place it on this side of the plate	Select **Use this label** and continue with step 4.
You want to print a label that is the same as a label already set up for another side of the plate	Select **Use *side* label** and continue with step 4. All other parameters on the page are ignored.

4. In the **Format to use** text box, type a number that corresponds to the bar code format that you want.

5. In the **Number of Fields** text box, type the number of fields that you want to print on the bar code.

   The maximum number of fields you can print is limited by the number of fields in the format you selected. For example, if the format specifies three fields you cannot print a bar code with four fields. In this example, if you do enter the number four into the text box, the last field is ignored.

6. Click in the **Field** text box for the first field that you want to use and enter one or more of the following types of information that you want to print in that position on the label:

If you want to print...	**Then...**
Text field that does not increment	Type the text in the text box.
A field that is identical to a bar code field on another side of the plate	To use this option, your VCode must have an attached bar code reader. a. Select the side of the plate from the **from *side* side** list box, below the **Use existing bar code button**. b. Click **Use existing bar code**. This places the code [BC] in the text box. *Note:* This option copies a single field from another side of the plate. The similar option selected in the **Printing Options** list box copies an entire bar code from another side of the plate.
A series of bar codes from a bar code input file	a. Make sure that you have set up a bar code input file and selected it in VWorks general options. b. Make sure that the number of bar codes specified in the series of the bar code input file that you want to use is equal to or greater than the number of labels that you want to print. c. Select the series in the **Bar code file entry** list box at the bottom of the toolbar. *Note:* If there are no entries in the **Bar code file entry** list box other than the default text, you need to set the location of the bar code input file. d. Click **From File**. This places the code [FILE] in the text box. **!! IMPORTANT !! If you use this option in two fields, the same data will be printed in both fields. You cannot enter different data into fields using this method.**

If you want to print...	Then...
A series of bar codes by referencing bar codes on another side of the plate, using a bar code data file	a. Make sure that you have created a bar code database file and selected it in VWorks general options. b. Make sure that the incoming plates have bar code labels on the south or west side, or a previous Apply Label task is set up to print labels on the south or west side. c. If the incoming plates are labelled, make sure that the system verifies the labels by setting up bar code control on the plate icon. d. Click **From text database**. This places the code [DB] in the text box. e. In the **use *side* side** list box under the **From text database** button, select the side of the plate that has the bar codes you want to use as a reference. **!! IMPORTANT !! Although you can select any side, only the south and west sides can currently be used.**
A series of bar codes that increment, but which are *not* specified by a bar code input file	a. Type the root data that you want in the **Field 1** text box. b. Click **Increment**. This adds the code [INC] to the root data. c. In the **Increment chars** text box, type the number of alphanumeric characters that you want to be appended to the root data. For example, if you want the series to increment from 01 enter 2. If you want it to increment from 001, enter 3. d. In the **Starting increment #** text box, type the number that you want to be printed on the first label, for example, 100. e. Select either **Numeric** or **Alphanumeric** depending on the increment style you prefer. Alphanumeric increments use 0–9, A–Z, whereas numeric increments use 0–9.
From a plug-in that you have developed	Select **From user plug-in**.

7. Return to step 6 and fill out another field until all required fields are completed.

   Note: If you enter information in a field that does not exist in the format you have chosen, the information is ignored.

8. Return to step 3 and define labels to put on other sides of the plate.

Related information

For information about...	See...
Apply Label task parameters	"About setting Apply Label task parameters" on page 184
Adding tasks to protocols	"Adding a task or pipette task" on page 168
Combining bar code modifiers	"About combining bar code modifiers" on page 188
Configuring a VCode as a device	"Workflow for configuring the VCode" on page 146
Bar code formats and symbologies	*VCode User Guide*
FileReader plug-in	"About the FileReader plug-in" on page 298

About combining bar code modifiers

About this topic

This topic describes how to combine bar code modifiers for the Apply Label task.

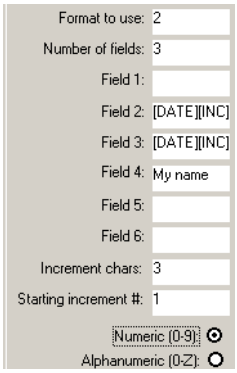
Bar code modifiers are text/numerical strings that are appended to the bar code. Typically they are used to add a readable text/numerical string to a bar code, which increments for each plate, giving each plate a unique label.

Combining bar code modifiers

You can combine bar code modifiers with text in a single field. This section shows how to do this by using an example. The example has five fields and for each field the symbology or font used has been defined as follows in the VCode.

Format field (valid for pre-2003 VCodes)	VWorks field	Symbology/Font
Field 0	Field 1	Swiss Mono 721 Bold
Field 1	Field 2	Code 39
Field 2	Field 3	Dutch Roman 801 prop
Field 3	Field 4	Dutch Roman 801 prop
Field 4	Field 5	Dutch Roman 801 prop

In the screenshot below, you can see that three of the VWorks fields are used: Field 2, Field 3, and Field 4.



Field 2 prints a Code 39 symbology bar code that is incremented for each printing. Field 3 prints the same bar code in the human readable Dutch Roman font. The text entered into Field 3 is the same as that entered into Field 2.

The information entered in Field 3, combined with the information entered into the Increment chars and Starting increment # fields, creates the following human readable bar code sequence:

*Date*001

*Date*002

*Date*003

*Date*004

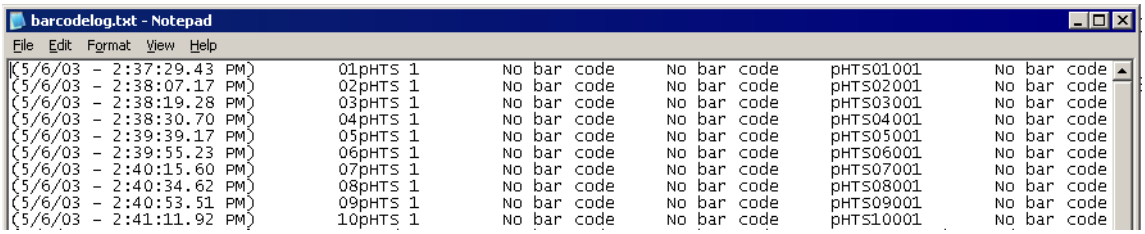
*Date*005

*Date*006

*Date*007...

The bar code log file

Information about the bar codes that are applied during a run is saved in a bar code log file. Because this is a tab-delimited text file, the data can easily be imported into a spreadsheet program.


barcodelog.txt - Notepad
File Edit Format View Help
(5/6/03 - 2:37:29.43 PM) 01pHTS 1 No bar code No bar code pHTS01001 No bar code
(5/6/03 - 2:38:07.17 PM) 02pHTS 1 No bar code No bar code pHTS02001 No bar code
(5/6/03 - 2:38:19.28 PM) 03pHTS 1 No bar code No bar code pHTS03001 No bar code
(5/6/03 - 2:38:30.70 PM) 04pHTS 1 No bar code No bar code pHTS04001 No bar code
(5/6/03 - 2:39:39.17 PM) 05pHTS 1 No bar code No bar code pHTS05001 No bar code
(5/6/03 - 2:39:55.23 PM) 06pHTS 1 No bar code No bar code pHTS06001 No bar code
(5/6/03 - 2:40:15.60 PM) 07pHTS 1 No bar code No bar code pHTS07001 No bar code
(5/6/03 - 2:40:34.62 PM) 08pHTS 1 No bar code No bar code pHTS08001 No bar code
(5/6/03 - 2:40:53.51 PM) 09pHTS 1 No bar code No bar code pHTS09001 No bar code
(5/6/03 - 2:41:11.92 PM) 10pHTS 1 No bar code No bar code pHTS10001 No bar code

Related information

For information about...	See...
Setting Apply Label task parameters	"Setting Apply Label task parameters" on page 185
Apply Label task parameters	"About setting Apply Label task parameters" on page 184
Configuring a VCode as a device	"Workflow for configuring the VCode" on page 146
Bar code formats and symbologies	*VCode User Guide*

Setting Centrifuge task parameters

About this topic

This topic describes how to set the Centrifuge task parameters for the VSpin.

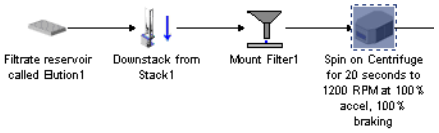
Centrifuge task defined

The Centrifuge task spins microplates according to the specified controls set in the task parameters toolbar. One plate with a counterweight or two plates can be spun at one time. Counterweights can be placed manually or robotically.

Procedure

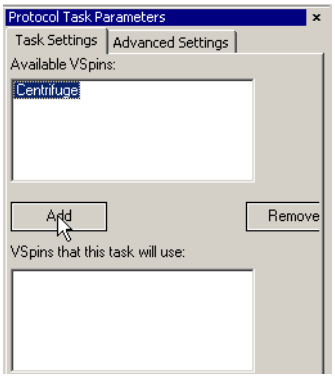
To set the Centrifuge task parameters:

1. Add the **Centrifuge** task to a protocol process.


Filtrate reservoir called Elution1
Downstack from Stack1
Mount Filter1
Spin on Centrifuge for 20 seconds to 1200 RPM at 100% accel, 100% braking

2. In the **Task Settings** page of the **Protocol Task Parameters** toolbar, select the VSpin you want to use from the Available VSpins list and click **Add**.

   The selected VSpin appears in the **VSpins for this task will use** list.



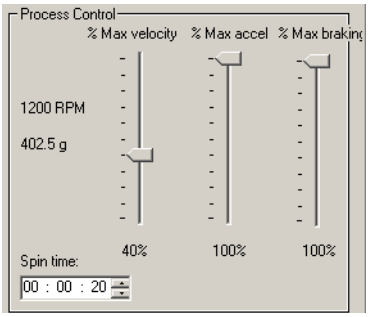
3. Set the spin parameters in the **Process Control** group box:
   a. In the **% Max velocity** slide bar, click and drag the slide bar pointer to the desired position.

      This setting determines the g force and rpm of the spin.
   b. In the **% Max accel** slide bar, click and drag the slide bar pointer to the desired position.

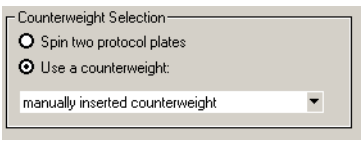
      This setting determines the rate at which the centrifuge reaches the maximum velocity.
   c. In the **% Max braking** slide bar, click and drag the slide bar pointer to the desired position.

      This setting determines the rate at which the centrifuge stops.
   d. Enter a value for the **Spin time** by either double-clicking in the field and entering a value, or clicking the arrow buttons to increment the time.

      The **Spin time** is the total time for centrifuging at full speed.



4. Select one of the counterweight options.



   a. If you are spinning two protocol plates at the same time, select **Spin two protocol plates**.

b. If you are spinning one protocol plate at a time, select **Use a counterweight** and make sure that you place the counterweight before the protocol starts.

Related information

For information about...	See...
Loading and balancing plates	*VSpin User Guide*
Adding tasks to protocols	"Adding a task or pipette task" on page 168
Configuring a VSpin	"Workflow for configuring the VSpin" on page 151
Configuring a VSpin with Access2	"Workflow for configuring the VSpin with Access2" on page 154
Using the VSpin	*VSpin User Guide*

Setting Delid/Relid task parameters

About this topic

This topic describes how to set the Delid/Relid task parameters.

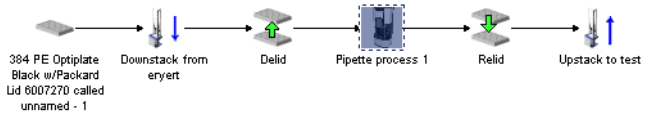
Delid/Relid task defined

The Delid task removes a plate's lid using a device such as a plate hotel or vacuum delidding station. The Relid task replaces the lid.

Neither the Delid nor Relid tasks have configurable parameters.

Example

The Delid/Relid tasks are used to remove and replace a plate lid. A typical use for this task is shown below:



In the example, a plate is downstacked and the lid is removed. The plate is pipetted at the VPrep and the lid is replaced. If your system has a trash chute and you want to remove a plate's lid and put the lid in the trash, use the Delid task and do not add a subsequent Relid task.

Procedure

Setting Delid/Relid task parameters

There are no task parameters for these processes.

Related information

For information about...	See...
Configuring the Delid Station as a device	"Workflow for configuring the delid station" on page 120
Adding tasks to protocols	"Adding a task or pipette task" on page 168
Configuring a platepad as a device	"Workflow for configuring the platepad" on page 136

Setting Downstack and Upstack task parameters

About this topic

This topic describes how to set the Downstack and Upstack task parameters.

Stacker task defined

The Downstack and Upstack tasks move plates into or out of Velocity11 VStacks or PerkinElmer PlateStaks.

The process of moving a plate out of a stacker is called downstacking. The process of moving a plate into a stacker is called upstacking.

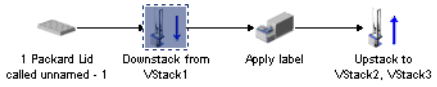
Plates may be returned to the same or different stackers.

You can make a single task upstack to, or downstack from, more than one stacker. For example, in a downstacking task, when all of the plates are removed from one stacker, the robot will begin to pick plates from a second stacker. The two stackers are referred to as pooled downstackers.

Procedure

To set Downstack and Upstack task parameters:

1. Add the **Downstack** or **Upstack** task to a protocol process.



2. In the list of available stackers in the **Protocol Task Parameters** toolbar, select a stacker to downstack from or upstack to and click **Add**.

   To select more than one stacker, SHIFT-click or CTRL-click before clicking **Add**.

   An asterisk next to a stacker in the list means that the stacker is currently assigned to a task that uses the same labware.

3. To remove a stacker from your list of available stacker devices, select it and click **Remove**.

4. If you have added more than one stacker, you can change the order in which particular stackers are used:
   a. Select a stacker.
   b. Click **Use earlier** to increase the priority of the stacker or **Use later** to decrease the priority of it.
5. To specify a time interval for when plates are made available to the system, select the **Release a new plate** check box and type in an interval time.

   You can use this feature to avoid a plate processing bottleneck that results in plates having different incubation times.

   Consider a simplified example process in which plates are downstacked, labels applied, liquid dispensed into, and then incubated for 10 minutes.

   Applying the label only takes a few seconds while subsequent tasks take longer. This creates a processing bottleneck.

   If the dispense task takes 2 minutes, plates that are ready for the pipetting step would have to wait. In this example, the first plate would incubate for approximately 5 minutes, the second plate for approximately 7 minutes, the third plate for approximately 9 minutes, and so on. To avoid these different incubation times, you could downstack one plate every 2 minutes. The plates are then incubated sequentially and not simultaneously.
6. If you want to dynamically assign an upstacking stacker, click **Add dynamically-assigned stacker.**

   Note: This option is only available for upstacking tasks.

   With dynamic assignment you do not have to specifically assign every stacker that will receive plates because assignments are made automatically.

   When stackers are dynamically assigned, the text "TBD," meaning **To Be Determined**, is added to the stacker task icon.

   Note: When using dynamically assigned stackers, you need to add a dynamic stacker to the Device Manager for each stack you expect to require.

   You can determine which stackers contain which plates at the end of the run by consulting the run log.

Related information

For information about...	See...
Configuring a VStack device	"Workflow for configuring the VStack" on page 157
Adding tasks to protocols	"Adding a task or pipette task" on page 168
Restacking parameters	"Setting Restack task parameters" on page 207
Restacking example	"Restack task example" on page 208
Velocity11 robots	*BioCel User Guide*

Setting Incubate task parameters

About this topic

This topic describes how to set the Incubate task parameters.

Incubate task defined

The Incubate task performs a timed incubation of a plate. It is typically used for short incubations.

The number of plates that can be incubated simultaneously is limited by the number of platepads and plate hotels that are available for holding plates.

Process overview

The overall process for a typical incubation is as follows:

1. Incubation of the plate starts with the addition of an initiating reagent.

   This would be performed by a liquid-handling task, such as QFill task or Pipette Process task.

2. The plate is moved to a platepad.

   When the plate arrives at the platepad, the incubation time parameter that you specify starts timing.

3. The plate is moved from the platepad to a reader.

   The plate is moved when the incubation time parameter that you specify ends.

Incubation time error

The time parameter that you set for the incubation period is not the actual time of incubation. It represents the minimum time that the plate sits on the platepad where the incubation task is carried out.

The actual incubation period starts when the initiating reagent is added and continues until the plate is transferred to the next step in the process. This means that the actual incubation is longer than the time parameter that you set, by an amount that depends on the scheduling and operating speed of the robot.

If your assays require greater precision in plate incubation times than this method supports, you can adjust the rate at which plates enter the system.

Procedure

To set incubation parameters:

1. Add the **Incubate** task to a protocol process window.
2. In the **Task Settings** page of the **Protocol Task Parameter** toolbar, type the length of time for which you want the plate to incubate on the platepad.
3. If you need to control the rate at which plates are delivered to a particular instrument, incubate the plates on a plate hotel or similar short-term storage device and select **Start timer when previous plate finishes incubating**.

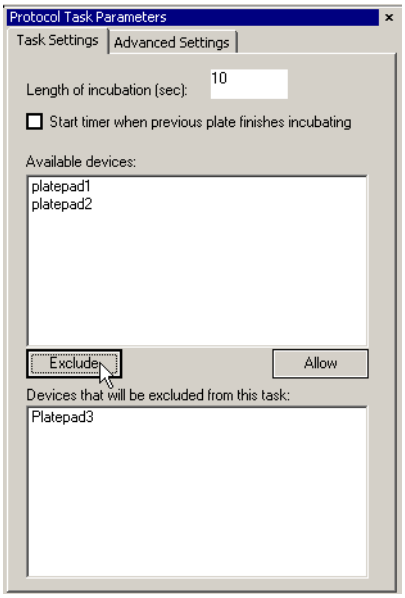
   A situation can arise in which plates move through a protocol too fast for one of the steps. An example is a pipetting step in which a reagent that starts a timed reaction is added to the plate. The result is that plates queue up at the pipettor.

   Without selecting the **Start timer when previous plate finishes incubating** check box, plates are delivered to the plate hotel as fast as the robot can deliver them, are incubated for the time specified in the **Length of incubation text box**, and then leave as fast as the robot can remove them. The robot may remove the plates as frequently as every 10 seconds.

   With the **Start timer when previous plate finishes incubating** check box selected, the time separation between each plate being picked up is specified by the value in the **Length of incubation text box**. Using this function, plates can leave the plate hotel and delivered to the pipettor every minute instead of every 10 seconds.

   An alternative way to control the time at which plates are delivered to an instrument is to use the **Release a new plate every *x* seconds** parameter for the Downstack task.
4. If you want to restrict a device so it is not used as the place where the incubation takes place, in the **Available devices** box, select the device and click **Exclude**.

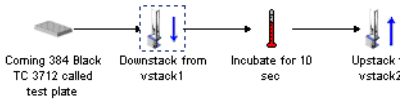
   This may be useful if a particular platepad is used during multiple steps of the protocol.



The name of the platepad moves to the lower box.

Example

In the following example, a plate is downstacked, moved to an incubator, and then upstacked.



Related information

For information about...	See...
Configuring a platepad as a device	"Workflow for configuring the platepad" on page 136
Adding tasks to protocols	"Adding a task or pipette task" on page 168
Using a StoreX device for incubating	*Device Driver User Guide*
Other tasks	"Setting task parameters" on page 169
Pipette tasks	"Setting pipette task parameters" on page 173

Setting Inoculate task parameters

About this topic

This topic describes how to set the Inoculate task parameters.

Inoculate task defined

The Inoculate task performs a transfer of material from a source plate to a destination plate using a pin tool.

Procedure

The Inoculate task was developed for the transfer of DNA from a source plate to a destination plate.

If you need to perform this task for this or another application, please contact the Velocity11 Service Center for a procedure on how to set this task up in a protocol.

Related information

For information about...	See...
Dispensing liquids	“Setting pipette task parameters” on page 173
Other tasks	“Setting task parameters” on page 169

Setting Load, Unload, and Incubate at storage device task parameters

About this topic

This topic describes how to set the Load, Unload, and Incubate at storage device tasks for a storage device.

Load, Unload, and Incubate at storage device defined

The Load task instructs a robot to move a defined set of plates into a storage device.

The Unload task instructs a robot to remove a defined set of plates from a storage device.

Using the Unload task and Load task in sequence instructs the robot to move a defined set of plates from one storage device to another.

The Incubate at storage device task moves a defined set of plates into a storage device, leaves them there for a specified time period and then removes them from the storage device.

These tasks are available for the following devices:

- ❑ PlateHub
- ❑ StoreX incubator

Procedures

To set the Unload task parameters:

1. Confirm that the plates you want to move are in the system.
2. Add the **Unload** task to a protocol process.
3. In the **Protocol Task Parameters** toolbar, drag the groups or locations you want to unload from the **Available groups/locations** list to the **Assigned groups/locations** list.

To set the Load task parameters:

1. Add the **Load** task to a protocol process.
2. In the **Protocol Task Parameters** toolbar, drag the groups or locations you want to load into from the **Available groups/ locations** list to the **Assigned groups/locations** list.

To set the incubate at storage device task parameters:

1. Add the **Incubate at plate storage device** task to a protocol process.

   Note: The **Incubate at plate storage device** task cannot be the last task in a process.
2. In the **Task Settings** page of the **Protocol Task Parameters** toolbar, select the devices that you don't want to use for the incubation from the **Available devices** list and click **Exclude**.

   The devices that you exclude appear in the **Devices that will be excluded from this task** list.
3. Enter the length of time to incubate in the **Length of incubation (sec)** field.

Related information

For information about...	See...
Configuring a Liconic StoreX	*Device Driver User Guide*
Configuring a PlateHub	*Device Driver User Guide*
Setting up plates in the inventory editor	❑ "About inventory groups" on page 311 ❑ "Creating a location group" on page 313 ❑ "Creating a plate group" on page 316
Moving plates to and from storage devices	❑ "Moving plates into a storage device" on page 318 ❑ "Moving stored plates out of the system" on page 321 ❑ "Moving plates between storage devices" on page 324
Using the inventory editor	"Inventory editor views and filters" on page 331

Setting Mount/Dismount task parameters

Introduction

This topic describes how to set the Mount and Dismount task parameters.

Mount/Dismount task defined

The Mount task places one plate on top of another plate and works in collaboration with the Waitfor task. The Dismount task removes a plate from the top of another plate.

When to use

These tasks are associated with a platepad device and are typically used to mount a filter plate onto another plate or reservoir.

Before you start

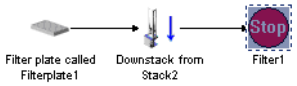
Before you start make sure that your labware is properly configured.

- ❑ The plate or reservoir you want to be on the bottom is set to Can be mounted in the Labware Editor
- ❑ The plate you want to be on the top is set to Can mount in the Labware Editor

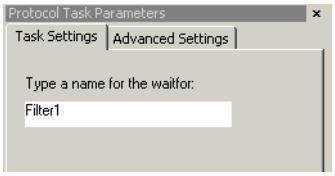
Procedure

To set Mount task parameters:

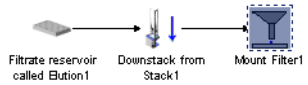
1. In the protocol process that is downstacking the upper plate (for example, a filter plate), add a **Waitfor** task at the position you want to mount the plate.



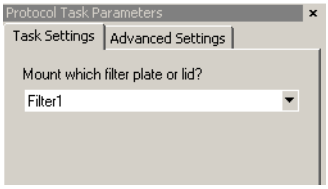
2. Select the **Waitfor** task.
3. In the **Protocol Task Parameters** toolbar, enter a name for the **Waitfor** task.



4. In the protocol process that is downstacking the lower plate (for example an elution plate), add the **Mount** task at the position you want to mount the plate.



5. Select the **Mount** task.
6. In the **Protocol Task Parameters** toolbar, select the labware you want to mount from the list box.

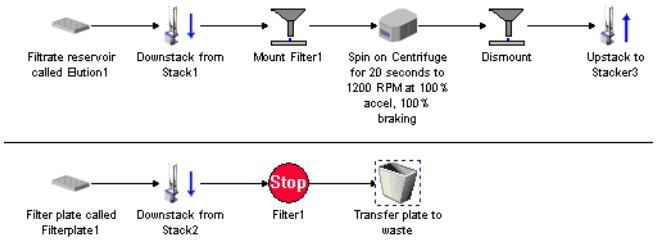


To set the Dismount task parameters:

1. Add the **Dismount** task to the protocol process to which you've added the **Mount** task.

   There are no task parameters for the **Dismount** task.

   In the following example, the mounted filter plate (sandwiched with the lower plate) was centrifuged, and then the filter plate was dismounted and discarded to waste. The lower or elution plate was then upstacked.



Related information

For information about...	See...
Using the Labware Editor	"Setting labware definitions" on page 337
Adding tasks to protocols	"Adding a task or pipette task" on page 168
Adding devices	"Adding devices" on page 107

Setting Pierce task parameters

About this topic

This topic describes how to set the Pierce task parameters with the PlatePierce.

Pierce task defined

The Pierce task pierces a plate seal using a PlatePierce.

Procedure

To set the Pierce task parameters:

1. Add the **Pierce** task to a protocol process.
2. In the **Task Settings** page of the **Protocol Task Parameter** toolbar, enter a value in the **Pierce Pressure** text box.

   If you are unsure of the best piercing pressure to use for your application, contact the Velocity11 Service Center.

Related information

For information about...	See...
Configuring a PlatePierce as a device	"Workflow for configuring the PlatePierce" on page 138
Other tasks	"Setting task parameters" on page 169
Adding tasks to protocols	"Adding a task or pipette task" on page 168
PlatePierce	*PlatePierce User Guide*

Setting Place Plate task parameters

About this topic

This topic describes how to set the Place Plate task parameters.

Place Plate task defined

The Place Plate task moves a plate to any location. This task has many uses.

The next task in the process after a Place Plate task moves the plate to another location.

Place Plate task and bar codes

The Place Plate task can be used in combination with a platepad bar code reader to read a bar code. The requirements for this are as follows:

- ❑ The platepad must be set up in the device manager as a bar code reader for the platepad.
- ❑ The plate icon for the plate must indicate that the plate has a bar code on the side that the bar code reader reads.

Whenever a plate is placed on this platepad, the scheduler tells the bar code reader to read the plate's bar code.

Procedure

To set the Place Plate task parameters:

1. Click the **Place Plate** task icon in the **Protocol Tasks** list and drag it to the desired location in the protocol process window.
2. In the **Task Settings** page of the **Protocol Task Parameter** toolbar, select the device to which you want to move the plate.

   You may need to scroll down to make your selection.
3. If the **Place Plate** task is the first task in the protocol, and you want to require that the operator confirms the bar code on the plate that is placed, check the **Manually confirm bar code** check box.

   This can prevent the wrong plate from being used in the protocol.

   To confirm the bar code, when the plate is picked up, the operator is prompted to enter the bar code of the plate that should be in the placed position. If the two codes do not match, an error is generated.

Related information

For information about...	See...
Configuring a platepad as a device	"Workflow for configuring the platepad" on page 136
Adding tasks to protocols	"Adding a task or pipette task" on page 168
Other tasks	"Setting task parameters" on page 169
Using the Apply Label task	"Setting Apply Label task parameters" on page 185

Setting Place Labware task parameters

About this topic

This topic describes how to set the Place Labware task parameters.

When to use

The Place Labware task is designed for labs that use multiple types of labware for a protocol. It is useful if you have devices where you want to use one type of labware on the device for some runs and another type for other runs of the same protocol. This saves you from having to create a device file for each protocol that uses a different type of labware.

If you are always using the same labware, you may not want to use this task.

The Place Labware task is only used in pre-protocol processes.

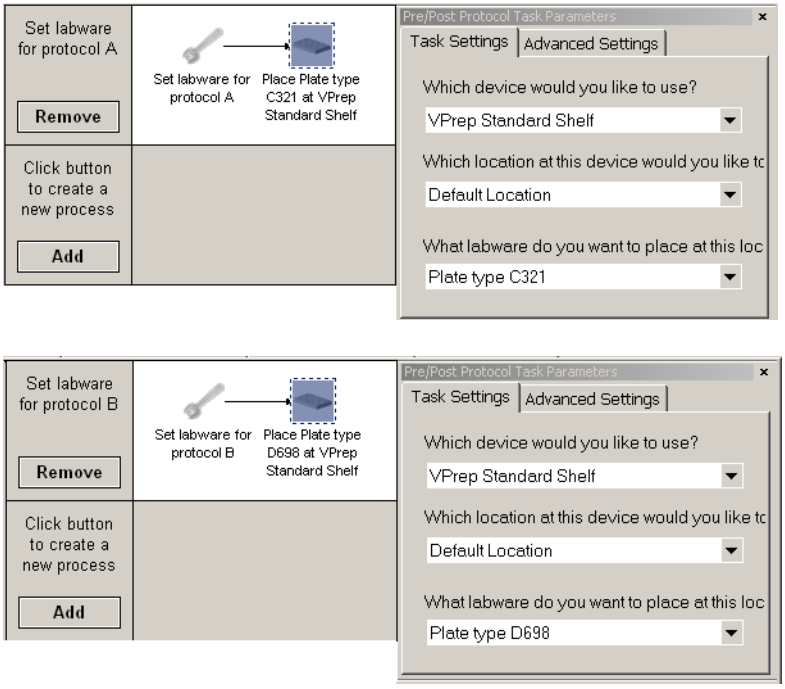
The Place Labware task can only be used with labware that is stationary throughout the running of the protocol.

The Place Labware task allows you to associate a labware entry with a device just before starting a run instead of in the device file.

Usage example

For example, if in one protocol you restrict use of a device to *labware1* only, and in another protocol you restrict use of the same *device* to *labware2* only, there are two ways to handle this:

1. Create two device files, one called *device* for *labware1* and another called device for *labware2*, where the labware type is specified in the "Allowed / prohibited labware" device property.
2. Create one device file where labware type is not specified, then create a pre-protocol for each protocol where the Place Labware task specifies the labware that must be used for the protocol.


Set labware for protocol A
Remove
Click button to create a new process
Add
Set labware for protocol A
Place Plate type C321 at VPrep Standard Shelf
Pre/Post Protocol Task Parameters
Task Settings
Advanced Settings
Which device would you like to use?
VPrep Standard Shelf
Which location at this device would you like to
Default Location
What labware do you want to place at this loc
Plate type C321
Set labware for protocol B
Remove
Click button to create a new process
Add
Set labware for protocol B
Place Plate type D698 at VPrep Standard Shelf
Pre/Post Protocol Task Parameters
Task Settings
Advanced Settings
Which device would you like to use?
VPrep Standard Shelf
Which location at this device would you like to
Default Location
What labware do you want to place at this loc
Plate type D698

Procedure

To set task parameters for the Place Labware pre-protocol task:

1. Click on the Place Labware icon and drag it from the pre-protocol task list to the protocol editor window until a vertical, dashed line appears.
2. In the **Task Settings** page of the **Pre/Post Protocol Task Parameters** toolbar select items from appropriate boxes:
   - The device you want to use with this task
   - The location of the labware on the device you are using
   - Labware type you are using in this protocol

Related information

For information about...	See...
Defining labware	“About defining labware with the labware editor” on page 338
Creating a protocol	“Workflow for creating a protocol” on page 163

Setting Restack task parameters

About this topic

This topic describes how to use the Restack task parameters.

Restack task defined

The Restack task collects plates in a stack, moves them to another stack in a definable time and in a way that maintains the proper order of the plates, and passes the plates to another task.

The Restack task can be used as part of a larger process that carries out simultaneous, timed incubations of more than one plate, where the goals are the following:

- ❑ Time between the start of the incubation and the reading of the plate to be approximately the same for each plate
- ❑ Evaporation from the plates is to be minimized

Note: Two or more VStacks are required to use the Restack task.

Procedure

To set Restack task parameters:

1. Add the **Restack** task to a protocol process.
2. In the **Protocol Task Parameters** toolbar either:
   - ◆ Select the empty stackers that you want to use for the task and click **Add.**
   - ◆ Click **Add dynamically-assigned stacker**.

     With this option, the scheduler automatically assigns stackers during a run, and there must be at least two stackers available for this operation.
3. In the **Store up to** text box, type a number equal to the number of plates you intend to incubate.

   This value is important because it can affect the timing of the incubation. For example, if the time taken to move all plates to the first restack stacker is greater than the time specified for the incubation, the first plate cannot be moved to the next task in time. This problem can be resolved by lowering the number of plates in a restack operation and adding more stackers.
4. In the **Incubate plate for** text box, type the time interval between when a plate enters the first restack stacker and leaves the second restack stacker.

!! IMPORTANT !! When you start a run that includes a Restack task, you must type in a number that is equal to the total number of plates you want to restack in the Number of Runs dialog box.

Related information

For information about...	See...
Downstacking and upstacking task parameters	"Setting Downstack and Upstack task parameters" on page 193
Adding tasks to protocols	"Adding a task or pipette task" on page 168
Configuring a VPrep as a device	"Workflow for configuring the VPrep" on page 148
Restacking example	"Restack task example" on page 208

Restack task example

About this topic

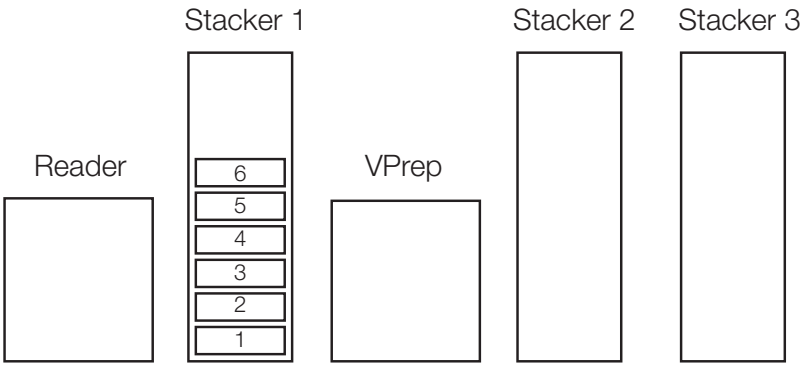
This topic uses an example to explain how the Restack task works.

Example

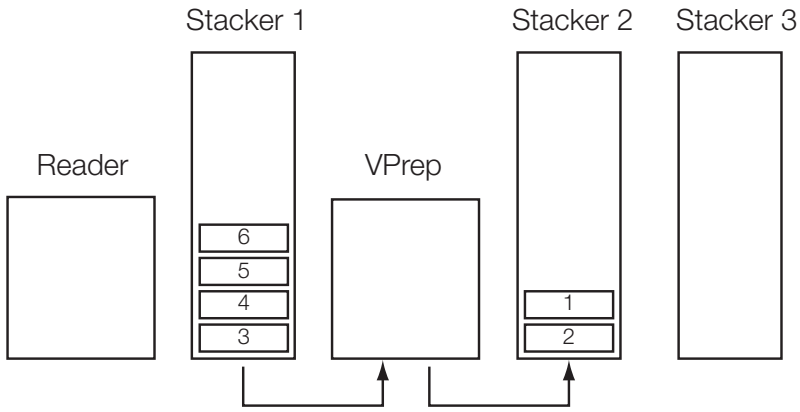
To understand the concept of a Restack task, it is best to view it in the context of a protocol. Consider the following simple restacking protocol as an example.

The overall flow of events in the protocol, in which individual steps do not necessarily correspond to individual protocol tasks, is as follows:

1. The plates are in a stack (Stacker 1) ready for the run.

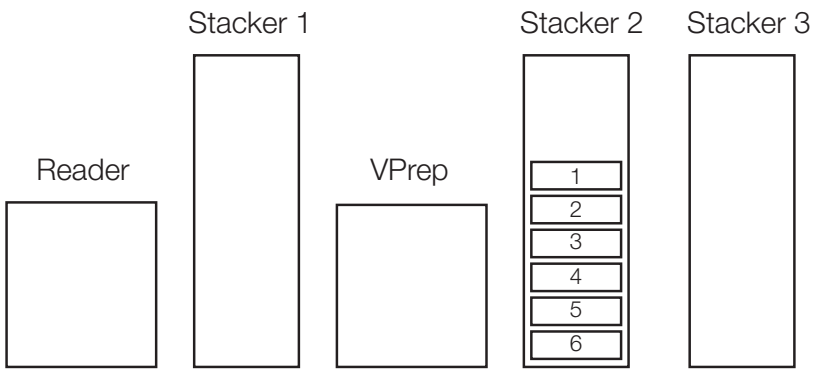


2. The plates are downstacked and moved to a VPrep where a reagent is added to initiate the incubation. The restack task begins when the plates are then moved to an empty rack (Stacker 2).



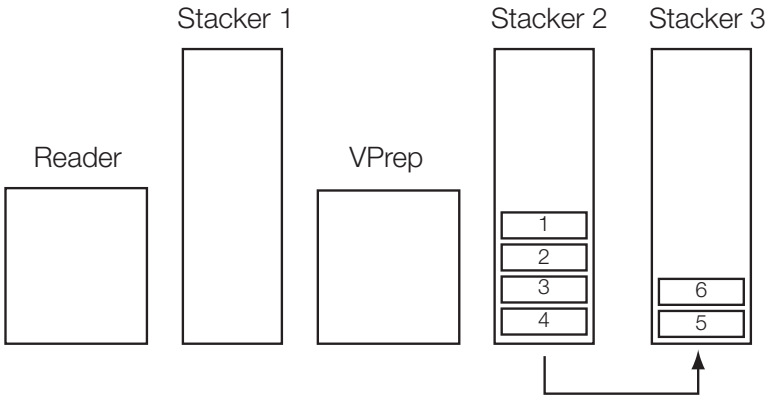
When the first plate enters the empty stacker, the incubation time parameter that you specify starts timing. However, the actual incubation started when the initiating reagent was added. The time between the actual incubation start and the time at which the incubation time parameter starts depends on the scheduling and operation speed of the robot, so it may not be exact from one plate to another.

3. The remaining plates are moved to the receiving stacker. The last plate to start incubating is now on the bottom.

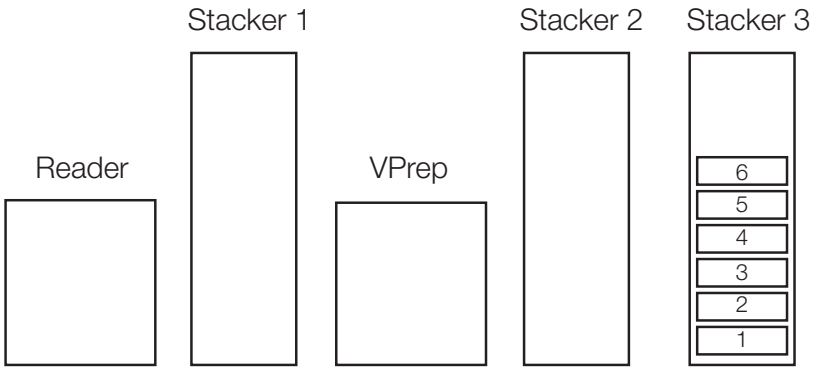


If plates are moved directly to a reader from this position the plate that has incubated for the least time is read first, leading to a large inconsistency in inter-plate incubation times. The plates must be restacked so that the plate that started incubating first is read first.

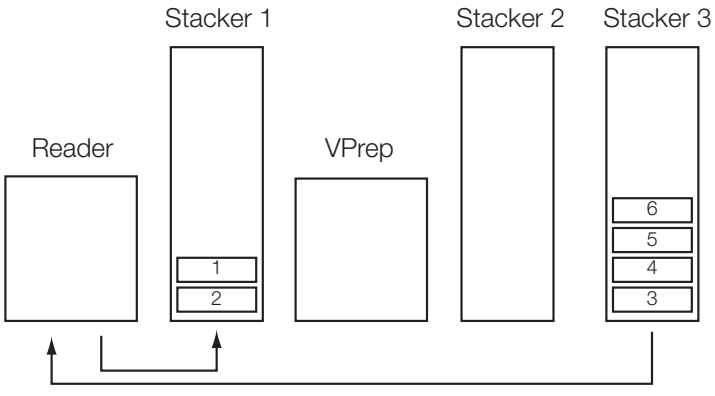
4. The plates are moved to another stacker, reversing their order.



5. The remaining plates are restacked so that the plate that started incubating first lies on the bottom.

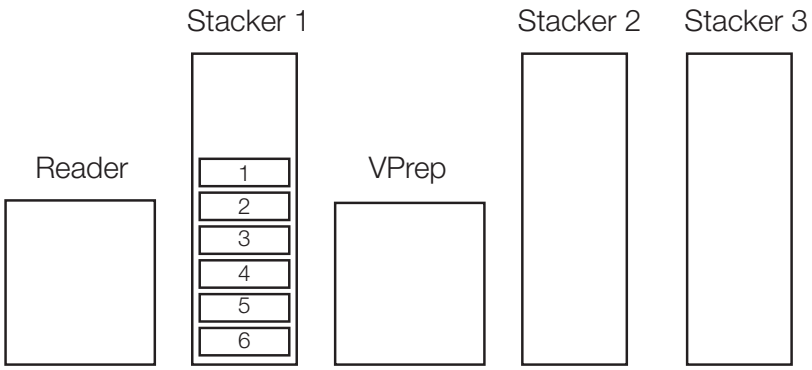


6. The plates are moved from the stack to the reader after the time interval specified in the Task Parameters toolbar. The plates are moved, one at a time, to a plate reader when their individual incubation times have elapsed, and then to storage. In this example, the final stack is the same as the starting stack.



The actual incubation continues as the robot moves the plate to the reader and the reader prepares to take measurements.

7. When the run is complete, all plates are in the final stack ready for removal from the system.



Related information

For information about...	See...
Setting Restack parameters	"Setting Restack task parameters" on page 207
Setting Downstack and Upstack task parameters	"Setting Downstack and Upstack task parameters" on page 193
Configuring a VPrep as a device	"Workflow for configuring the VPrep" on page 148

Setting Seal task parameters

About this topic

This topic describes how to set the Seal task parameters.

Seal task defined

The Seal task places a seal on a plate using a PlateLoc.

If you are sealing more than one type of plate that requires different sealing temperatures, we recommend that you use a separate PlateLoc for each temperature. This avoids time delays as the PlateLoc heats and cools between different plate types.

When you open a protocol containing one or more Seal tasks, the PlateLoc immediately starts adjusting to the temperatures defined in the task parameters.

Procedure

To set Seal task parameters:

1. Add the **Seal** task to a protocol process.
2. In the **Protocol Task Parameters** toolbar, enter a seal time and seal temperature.

   When you enter a seal temperature, the PlateLoc immediately starts adjusting to that temperature.
3. Select the PlateLoc to use for the sealing operation from the **Select PlateLoc to use** list box.

   If you are using more than one PlateLoc, make sure that you select the device with the correct seal type temperature and time for the plate.

Related information

For information about...	See...
Configuring a PlateLoc as a device	“Workflow for configuring the PlateLoc” on page 132
Other tasks	“Setting task parameters” on page 169
Adding tasks to protocols	“Adding a task or pipette task” on page 168

Setting User Message task parameters

About this topic

This topic describes how to set the parameters for the User Message task.

User Message task defined

The Administrator or Technician who creates a protocol can add User Message tasks to provide reminders to the operator. The reminders are in the form of messages that appear on the screen at the appropriate time and pause the protocol until acknowledged by the operator.

User message tasks can, for example, be used to remind the operator to empty the waste container, fill a reservoir, or remove plates.

!! IMPORTANT !! Remember to remove all user messages from protocols that you intend to run unattended.

Example

In the example shown below, the protocol has four user messages that remind the operator to perform final run-preparation tasks. The user messages appear before the plates are downstacked.

The intended sequencing of the User Messages tasks can be ensured by the addition of Signal tasks to the other processes in the protocol.

384 ABGene deepwell called SourceA
385 Tips; Manually attach tips to 384 pipetter on VPrep;
Make sure the A1 Wells are in the far left position;
Make sure stacker1 is fully loaded with fresh384plates.;
Downstack from stacker1

Procedure

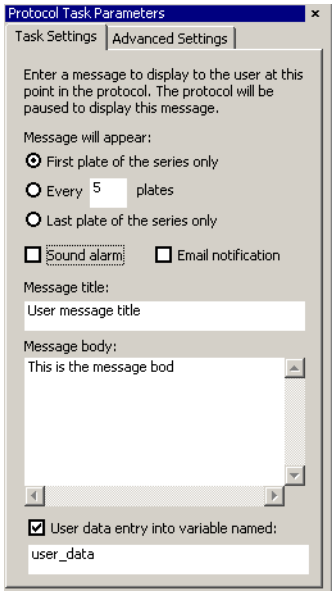
To set User Message task parameters:

1. Add the **User Message** task to a protocol process.
2. In the **Protocol Task Parameters** toolbar, select a **Message will appear** option using the following table as a guide.

Option	Description
First plate of the series only	Displays the message the first time it is encountered for that process during the run.
Every *x* plates	Displays the message the first time it is encountered for that process, and then every *x* number of times it is encountered for that process during the run. For example, if the value of *x* is 3, the first plate and the fourth plates in the protocol will trigger the message.
Last plate of the series only	Displays the message the last time it is encountered for that process during the run.
Sound alarm	Sounds an alarm when message is displayed.

Option	Description
Email notification	Sends an email when message is displayed.
User data entry into variable named	Displays a message that asks for input from the user. The message is generated from a script that is added to one of the tasks.

3. Type the message that you want to display:
   a. Type the message title in the top text box.
      This appears in the process line.
   b. Type the message body in the bottom text box.
4. If using a variable, enter the name in the text box.


Protocol Task Parameters
Task Settings
Advanced Settings
Enter a message to display to the user at this point in the protocol. The protocol will be paused to display this message.
Message will appear:
First plate of the series only
Every 5 plates
Last plate of the series only
Sound alarm
Email notification
Message title:
User message title
Message body:
This is the message bod
User data entry into variable named:
user_data

Related information

For information about...	See...
Creating scripts	"Using JavaScript in VWorks" on page 269
Creating a protocol	"Workflow for creating a protocol" on page 163
Other tasks	"Setting task parameters" on page 169
Adding tasks to protocols	"Adding a task or pipette task" on page 168

Setting Vacuum task parameters

About this topic

This topic describes how to set the Vacuum task parameters associated with a vacuum station device.

Vacuum task defined

The Vacuum task requires a vacuum plate and vacuum pump to be fitted to the lab automation system. The task is used to perform a vacuum filtration with filter plates.

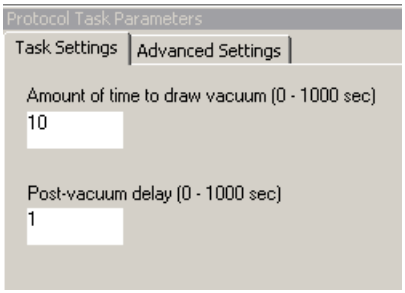
!! IMPORTANT !! Do not confuse this task with the Delid/Relid task, which uses a vacuum to remove lids from plates.

Procedure

To set the Vacuum task parameters:

1. Add the **Vacuum** task to a protocol process.
2. In the **Protocol Task Parameters** toolbar:
   a. In the **Amount of time to draw vacuum** text box, enter the length of time that you want the vacuum to pull.
   b. In the **Post-vacuum delay** field, enter the time that you want to elapse between the time the vacuum pump stops and when the plate is available to be picked up by the robot.

      The delay is the time that elapses before the robot picks up the plate, allowing the vacuum under the plate to dissipate. If this value is too small, the robot may not pick up the plate correctly.



Related information

For information about...	See...
Configuring a Vacuum Station as a device	“Setting the vacuum station device properties” on page 145
Other tasks	“Setting task parameters” on page 169
Delidding plates	“Setting Delid/Relid task parameters” on page 192

Setting VSpin with Access2 task parameters

About this topic

This topic describes how to set the VSpin with Access2 task parameters.

VSpin with Access2 task defined

This task moves a plate to an Access2 and centrifuges it.

Setting VSpin with Access2 task parameters

To set VSpin with Access 2 task parameters:

1. Add the **VSpin with Access 2** task to a protocol process.
2. In the **Task Settings** page of the **Protocol Task Parameter** toolbar, select a VSpin from the **Select a VSpin with Access 2 to use** list box.
3. Set the desired options in the **Load Plate** group box:
   a. Enter the **Gripper Z offset (mm**) for the plate you are using. This value is the distance from the bottom of the plate to where the Access2 grippers will grab the plate. Typically, this value is the same as the robot gripper offset.
   b. If you don't want to use the plate sensor on the Access2, select the **Ignore optical plate sensor** check box.
   c. If you are using flexible plates, such as PCR plates, select the **Grip gently** check box.
4. Set the spinning parameters in the **Spin Plate** group box. Enter a value for the **Velocity (%)**, **Acceleration (%)** and **Deceleration (%)**.

   These parameters are calculated as a percentage of the maximum value possible. Maximum speed is 3000 rpm. For more information, see the *VSpin User Guide*.
5. Set the spin duration.
   a. Choose a **Timer mode** option.

      Total time includes the time it takes the VSpin to accelerate to the target speed and decelerate to a stop.

      Time at speed only includes the time that the rotor is at the target speed.
   b. Enter the spin duration.

      The format for the timer is hours:minutes:seconds.

Related information

For information about...	See...
Configuring a VSpin with Access2 as a device	"Workflow for configuring the VSpin with Access2" on page 154
Configuring a VSpin as a device	"Workflow for configuring the VSpin" on page 151
Adding tasks to protocols	"Adding a task or pipette task" on page 168
Other tasks	"Setting task parameters" on page 169
The VSpin	*VSpin User Guide*
The Access2	*Access2 User Guide*

Setting Waitfor task and Signal task parameters

About this topic

This topic describes how to set the Waitfor and Signal task parameters.

Waitfor and Signal tasks defined

The Waitfor task and a Signal task work together to specify the order in which tasks are performed across processes.

You must first set the Waitfor task and then set the Signal task.

Procedure

To set Waitfor task parameters:

1. Add a **Waitfor** task to a protocol process.
2. In the **Protocol Task Parameters** toolbar, type a name for the task.

To set Signal task parameters:

1. Add a **Signal** task to a protocol process.
2. In the **Available waitfors** text box of the **Protocol Task Parameters** toolbar, select the **Waitfor** task that you want to reference.
3. Click **Add**.

   The task moves to the lower box.

Related information

For information about...	See...
Creating a protocol	“Workflow for creating a protocol” on page 163
Using the Waitfor and Signal task in a protocol	“Specifying task order across processes” on page 218
Adding tasks to protocols	“Adding a task or pipette task” on page 168
Other tasks	“Setting task parameters” on page 169

Specifying task order across processes

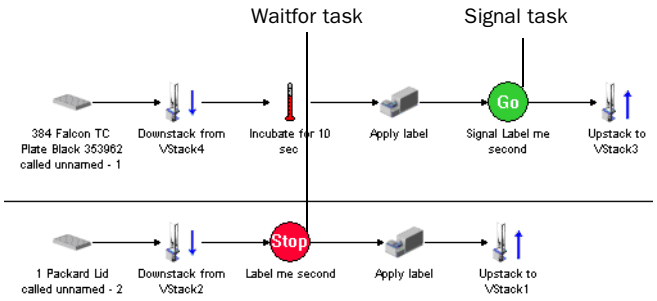
About this topic

This topic uses an example to demonstrate how you can use the Waitfor task and Signal task to determine the order in which tasks are executed. This is useful when you are running more than one process in a protocol, and you want a particular task in one process to be performed before a particular task in another process.

Example

In this example, the Administrator or Technician creating the protocol wants to make sure that a bar code is applied to plate 1 before plate 2.

The operator creates the protocol shown in the following diagram.



The order in which plate 1 and plate 2 are processed is selected by the scheduler program. Without the Waitfor and Signal tasks, this would also be the case for the bar coding operation. However, in this protocol, the Waitfor task, called “Label Me Second”, is included for Plate 2, and this causes the process to wait until it receives an instruction to continue. Meanwhile, the bar code is applied to Plate 1.

After the bar code has been applied to Plate 1, the Signal task called “Label Me Second” releases the wait condition on Plate 2 and the bar code is applied.

Related information

For information about...	See...
Creating a protocol	“Workflow for creating a protocol” on page 163
Adding tasks to protocols	“Adding a task or pipette task” on page 168
Setting the Waitfor and Signal task parameters	“Setting Waitfor task and Signal task parameters” on page 217
Other tasks	“Setting task parameters” on page 169

Setting VPrep pipette task parameters

10

This chapter describes how to set the pipette tasks in VWorks for the Velocity11 VPrep device.

Anyone who is writing protocols that uses a VPrep should read this chapter.

Configuring a pipette process: example

About this topic

This topic gives an example of how to construct a protocol sub-process that performs a simple pipetting operation. See Related information at the end of this topic for more information about creating a pipet process.

The example

The goal of the pipetting operation in this example is to pipette 20 µL of 1X TE buffer from a reservoir on a particular VPrep into a Costar 96-well plate.

Creating a protocol

The first step is to create a new protocol by setting up a plate icon for the plate you want to pipette into.

Name the plate icon “Plate A” and select the “Costar 96-well plate” as the plate type.

Downstacking a plate

The next step is to add a Downstack task that downstacks a plate from an appropriate stacker.

Adding a Pipette Process task

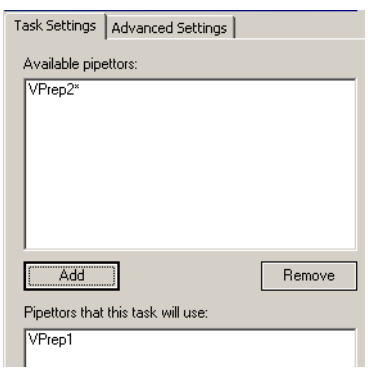
Next, you add a Pipette Process task.

Because there can be a number of Pipette Process tasks in a protocol, this particular pipetting operation is identified by the name selected from the list box in the Pipette Task Parameters toolbar. In this simple case there is only one name to select, which is “Process1.”

Selecting a VPrep

In this example, there are two VPrep pipettors already configured in VWorks so you need to associate the one you want to use with the pipette process.

You do this in the Pipette Process Editor page. In the following example, the task will use VPrep1. VPrep2 remains available but is not used for this process.

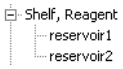


Configuring the VPrep shelf

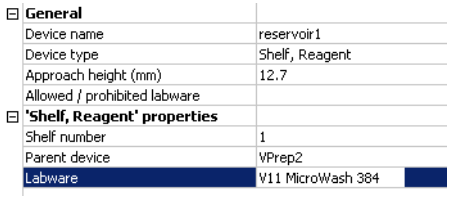
You want to aspirate 20 µL of 1X TE buffer from a reservoir. This means that you have to configure a shelf of the VPrep to hold the reservoir that will contain the buffer. You decide to use a 384 V11 Reservoir (manual fill) 21.5 deep plate type for the reservoir.

We know that the VPrep itself has already been configured in VWorks as a device because you were able to select it in the previous step. We can also see it listed as a device in the device manager. To open the device manager you click the Device Manager tab.

Each shelf that you want to use on the VPrep must also be configured as a device. The shelves are already set up as devices, but you need to make sure that shelf 1, where you want to place the buffer reservoir, is configured correctly. Again looking at the device manager you see that there are two shelves configured as reagent shelves, which can hold reservoirs.



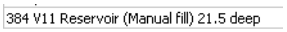
On selecting reservoir 1 you see that it is assigned to shelf 1 of VPrep 2, which is what you want. However, the labware associated with the shelf is the wrong type.



If you leave it as V11 MicroWash 384, the pipette tips may crash into the reservoir because the task will be performed on the assumption that the tips are moving into a 384 V11 Reservoir (manual fill) 21.5 deep reservoir.

So, you change the labware association to 384 V11 Reservoir (manual fill) 21.5 deep.

Note: To save the changes in the device manager you need to have Administrator login privileges.

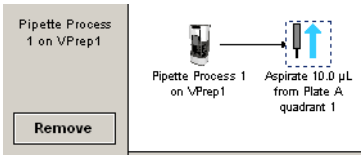


Note that when you associate a type of labware with the VPrep shelf, you are also associating all of the parameters for that type of labware stored in the labware database. The VPrep references the labware database parameters so that the pipette tips move to the right depth, position, and so on, as they enter the reservoir.

After configuring a VPrep shelf, compile the current protocol to check for errors.

Adding the Aspirate pipette task

The next step is to add the Aspirate pipette task.



Associating the task with a liquid class

In the Pipette Task Parameters toolbar of the Aspirate pipette task, you need to tell the system what class of liquid it is aspirating. The system then uses the parameters stored in the liquid library database for that class, during the aspiration operation.

In this case you select the class 1XTE.

You can see the parameters used for the class by clicking the Edit button, which opens the liquid library editor.

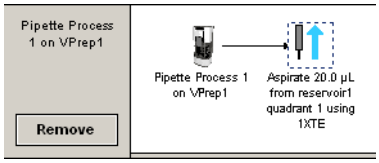
Associating the task with the VPrep shelf

In the Pipette Task Parameters toolbar of the Aspirate pipette task you need to tell the system from what type of labware to aspirate.

In this case there are two choices. If you select Plate A, the Costar 96-well plate you downstacked will be moved to the VPrep and the volume aspirated from it. Instead, you select reservoir1, which is the name of the device that holds the buffer reservoir.

Finally, you specify that we want to aspirate 20 µL.

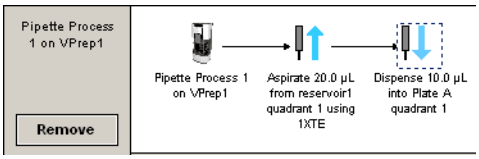
The modified task is shown in the following diagram:



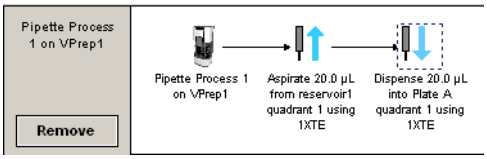
Adding a Dispense task

To complete the pipetting operation we have to add a Dispense task and set the parameters

Drag the Dispense task into the pipette process pane.


Pipette Process 1 on VPrep1
Remove
Pipette Process 1 on VPrep1
Aspirate 20.0 µL from reservoir1 quadrant 1 using 1XTE
Dispense 10.0 µL into Plate A quadrant 1

The task correctly defaults to dispense into Plate A, but the dispense volume is incorrect and there is no associated liquid class. After editing the task parameters, the task is shown in the following diagram:


Pipette Process 1 on VPrep1
Remove
Pipette Process 1 on VPrep1
Aspirate 20.0 µL from reservoir1 quadrant 1 using 1XTE
Dispense 20.0 µL into Plate A quadrant 1 using 1XTE

The protocol is now complete.

Related information

For information about...	See...
VPrep task parameters	“Understanding the configuration settings in a pipette task” on page 290
Creating a pipette process	“Adding and configuring a pipette process task” on page 226
Creating protocol basics	“Workflow for creating a protocol” on page 163
Specific pipette tasks	“Setting pipette task parameters” on page 173

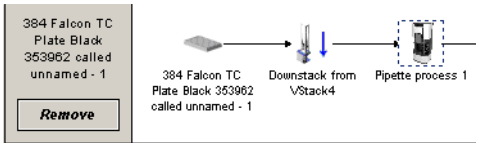
Adding and configuring a pipette process task

About this topic

This topic describes how to configure a Pipette Process task for a Velocity11 VPrep.

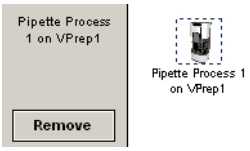
Adding a Pipette Process task

The first step in creating a pipette process is to add a Pipette Process task to the protocol editor. Drag the Pipette process icon into the protocol process.


384 Falcon TC Plate Black 353962 called unnamed - 1
Remove
384 Falcon TC Plate Black 353962 called unnamed - 1
Downstack from VStack4
Pipette process 1

Setting Pipette Process parameters

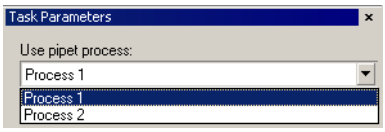
When you add the Pipette Process task, a new pipette process is started in the pipette process editor. The pipette process is identified by its Pipette Process link icon.



Because you can have more than one pipette process in a protocol, you must link the Pipette Process task to the pipette process by setting the Pipette Process parameters.

To set the Pipette Process parameters:

1. In the **Protocol Editor** window, add a **Pipette Process** task to the protocol and then select it in the protocol sequence.
2. In the **Pipette Task Parameters** toolbar, select the pipette process that you want to use for this pipetting task.



3. If the pipette process is for a replicate pipetting series, so that the same plate can be used over and over again, select the **Use single instance of plates** check box in the **Task Setting** page of the plate icon.

   If the plate is a tip box, when this option is selected, the tips will be picked up and the tip box will be moved from the VPrep. At the end of the pipetting series, the tip box will be returned to the VPrep and the tips replaced in it.

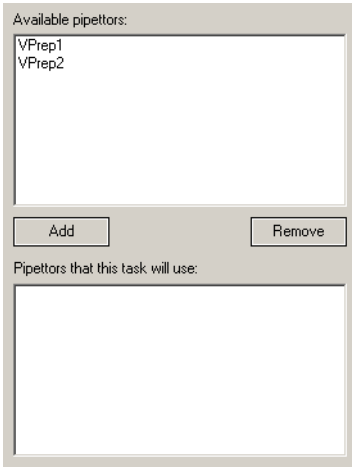
Associating the link icon

Because you can have more than one VPrep on a lab automation system, you must link each pipette process link icon with one or more VPreps that you want the pipette task to be able to use. You do this by setting the parameter for the pipette process link icon.

To link a Pipette Process task to a pipette process:

1. In the **Pipette Process Editor**, select the **Pipette process** link icon.

2. In the **Available pipettors** list of the **Pipette Task Parameters** toolbar, select one or more pipettors to link to and click **Add**.



The selected pipettors move to the lower box and become available for the pipette task to use.

Related information

For information about...	See...
Pipette sub-process	“Configuring a pipette process: example” on page 222
Configuring a VPrep shelf	“Workflow for configuring a VPrep shelf” on page 141
Creating protocol basics	“Workflow for creating a protocol” on page 163
Specific pipette tasks	“Setting pipette task parameters” on page 173

Setting Aspirate pipette task parameters

About this topic

This topic describes how to set the Aspirate pipette task parameters for a Velocity11 VPrep.

Aspirate pipette task defined

An Aspirate pipette task is used with a VPrep to draw up liquid from a plate or reservoir.

Before you start

Before you start setting the Aspirate task parameters, you will need to associate a VPrep shelf with the labware type that will be used for the aspirating.

Procedure

To set Aspirate pipette task parameters:

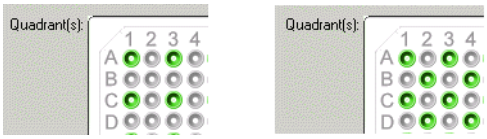
1. Add an **Aspirate** pipette task icon to the pipette process editor window.
2. If you have defined a liquid class for the liquid you intend to aspirate, select it from the **Liquid class** list box at the bottom of the **Pipette Task Parameters** toolbar.
3. Complete the following fields:

Field	Description
Aspirate volume	The volume of liquid to be drawn up into each pipette tip.
Aspirate velocity	The rate at which to draw up liquid. If you selected a liquid class, this value is entered automatically from the liquid library editor and cannot be edited here.
Aspirate acceleration	The rate of increase in velocity before the maximum aspirate velocity is reached. If you selected a liquid class, this value is entered automatically from the liquid library editor and cannot be edited here.
Distance from well bottom	The distance between the bottom of the pipette tips and the bottoms of the plate wells or MicroWash tray chimneys. If you are using dynamic tip retraction this value sets the lowest point to which the tips will travel.

Field	Description
Tip retract distance	The distance that the tips should move downwards per unit volume of liquid being aspirated. This value allows the tips to move downwards during aspiration to maintain a certain height below the surface of the liquid. You will need to determine an appropriate value by trial-and-error for each type of plate you use. You might want this value to be the same as the Tip Retract Distance for the Dispense pipette task.
Pre-aspirate volume	The volume of air to be drawn up before the pipette tips enter the liquid.
Post-aspirate volume	The volume of air to be drawn up after the liquid is drawn up.

4. If the VPrep head has fewer tips than the plate has wells, select a quadrant configuration from the **Quadrant(s)** diagram to indicate which well quadrant of the plate you want to aspirate from.

   To select a quadrant, click a representative well. Two possible examples are shown below.



5. In the **Plate to Aspirate from** list box, select the type of labware or device from which to aspirate.
6. If you do not want to record this dispense in the transfer log, clear the **Record in transfer log** check box.

   You might do this, for example, if you are running a casual test protocol.

Related information

For more information about...	See...
Associating labware with a VPrep shelf	"Configuring a pipette process: example" on page 222
Creating a pipette process	"Adding and configuring a pipette process task" on page 226
Creating protocol basics	"Workflow for creating a protocol" on page 163
Specific pipette tasks	"Setting pipette task parameters" on page 173

Setting Change Instance pipette task parameters

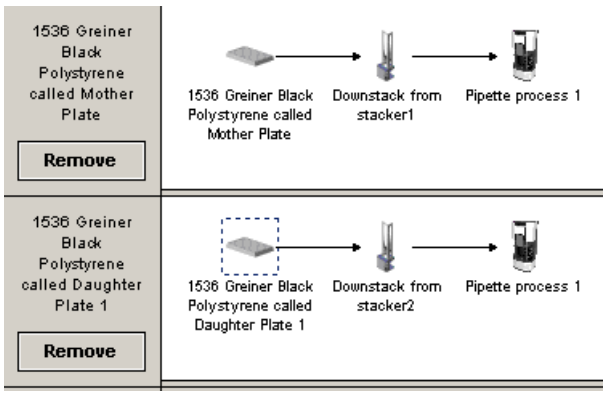
About this topic

This topic describes how to set the Change Instance task parameters for a Velocity11 VPrep.

Change Instance pipette task defined

The Change Instance pipette task is used in combination with a pipette loop to perform replicate dispense operations from a mother plate into a series of daughter plates.

Part of an example protocol, which contains a mother plate and the first of 10 daughter plates, is shown below.


1536 Greiner Black Polystyrene called Mother Plate
Remove
1536 Greiner Black Polystyrene called Mother Plate
Downstack from stacker1
Pipette process 1
1536 Greiner Black Polystyrene called Daughter Plate 1
Remove
1536 Greiner Black Polystyrene called Daughter Plate 1
Downstack from stacker2
Pipette process 1

An example pipette process for the mother plate is shown below.

Pipette Process 1
Aspirate 100.00 µL from Mother Plate 1 quadrant(s)
Loop 10 times
Dispense 10.00 µL into Daughter Plate 1 in 1 quadrant(s)
Change instance
End of loop

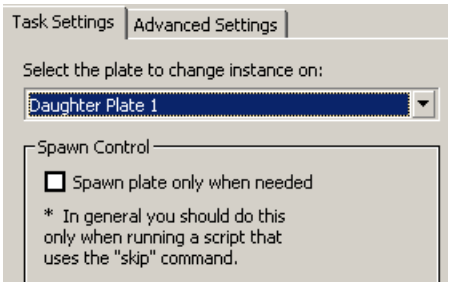
Note: This example has been simplified for the purposes of explanation.

When the protocol runs, 100 µl from each well of the mother plate are aspirated and 10 µl are dispensed into the first daughter plate (Daughter Plate 1). When the Change Instance task is reached, Daughter Plate 2 is moved into the system and 10 µl are dispensed into it from the mother plate. This loop repeats until all 10 daughter plates have been dispensed into.

Procedure

To set change instance pipette task parameters:

1. Set up a protocol and pipette processes following the example shown above.
2. In the **Pipette Task Parameters** toolbar, from the list box, select the first daughter plate for the plate icon to change instance on.


Task Settings
Advanced Settings
Select the plate to change instance on:
Daughter Plate 1
Spawn Control
Spawn plate only when needed
* In general you should do this only when running a script that uses the "skip" command.

3. If you are using a script in the protocol that involves task skipping, check the **Spawn control** check box to force VWorks to only bring in the next plate when the Change Instance task is reached.

   The script may otherwise override this flow.

Related information

For more information about...	See...
Creating a pipette process	"Adding and configuring a pipette process task" on page 226
Creating protocol basics	"Workflow for creating a protocol" on page 163
Setting Loop task parameters	"Setting Loop pipette task parameters" on page 248

Setting Change Tips pipette task parameters

About this topic

This topic describes how to set the Change Tips task parameters for a Velocity11 VPrep.

Change Tips pipette task defined

The Change Tips pipette task uses the robot to apply or remove VPrep pipette tips.

Pairs of Change Tips pipette tasks are usually used together. For example, if the protocol starts with tips already on the VPrep, the first Change Tips pipette task would remove the tips and the second Change Tips pipette task would install new tips.

Change Tips pipette tasks are always used as part of a whole process created for the sole purpose of changing tips, an example of which is described in this topic.

Before you start

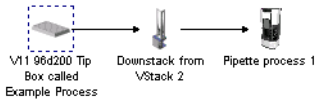
Before you start you need to configure a shelf on the VPrep to use tip boxes and have ready a tip box, containing tips, with the tip box lid removed and placed in a robot-accessible position.

Also, if you are removing tips first, you will need an empty tip box on the tip box shelf of the VPrep that you intend to use for the operation.

Overall process

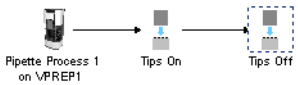
Changing tips with a VPrep requires you to create the following processes:

1. In the protocol editor, create a process for the tip box, such as in the following example.



   If your tip box has a lid, you will need to check the **Plates have lids** check box in the plate icon and add Delid/Relid tasks to remove the lid before the pipette process.

2. In the pipette process editor, create a pipette process to change tips, such as in the following simple example.



Creating the process for the tip box

Before you can add a Change Tips pipette task, you must create a process for the tip box that will contain the tips.

Creating a process for the tip box:

1. Click the **Protocol Editor** tab.
2. Click **Add**.

   A plate definition icon appears in the **Protocol Editor** window.
3. If the **Protocol Task Parameters** toolbar is not showing, select **View > Toolbars > Protocol Task Parameters**.
4. In the **Protocol Task Parameters** toolbar:
   a. Type a name for the plate in the **Plate Name** text box.
   b. In the **Plate type** list box, select the tip box that has already been configured for use on the shelf of the VPrep that you intend to use.

      When you select a tip box, Stacker, Pipette process and Waste tasks are automatically added.
   c. In the **Simultaneous Plates** text box, type the maximum number of plates of this type that you want to be available to the system at one time.
   d. If the tip boxes have lids, select the **Plates have lids** check box.

      If the check box is unavailable, make sure that the selected plate type is set to allow the use of a lid in the labware editor.

      !! IMPORTANT !! If this option is not selected and the tip box has a lid, the VPrep head will crash into the tip box lid and return a *z*-axis position error that will require a recovery procedure.
   e. Leave the **Plates enter the system sealed** check box clear.
   f. If the tip boxes have a bar code on the south side, select the first **Incoming plates have a bar code**... check box.
   g. In the **Bar Code Control** group box, select one or more of the options if you want bar codes on the tip boxes to be read and compared with a bar code input file during a run.
   h. If the tip boxes have a bar code on the west side, select the second **Incoming plates have a bar code**... check box.
5. Select the **Downstack** task in the protocol process window.
6. Set the **Downstack** task parameters.
7. Select the **Pipette Process** task in the protocol process window.
8. Set the **Pipette Process** task parameters.
9. If you only intend to add tips during this process, delete the **Transfer plate to trash** task.
10. Add any other tasks that you want to for the tip box.

    You could, for example, add an **Apply Label** task to place a bar code on the tip box.

Creating the Pipette Process for changing tips

After you have created a process for the tip box, create a pipette process for the Change Tips pipette task.

To create a pipette process for changing tips:

1. Click the **Pipette Process Editor** tab.
2. Add a **Change Tips** pipette task to the pipette process window.
3. In the **Pipette Task Parameters** toolbar, select either:

Option	With this option, during the protocol...
❑ Press On New Tips	Puts tips on to a VPrep head.
❑ Tips off	Removes tips from a VPrep head.

4. From the **Select the tip box to use** list box, select the name of the tip box that you have assigned to the tip box process.
5. Add other pipette tasks, including a second **Change Tips** pipette task, as required.

Related information

For more information about...	See...
Creating a pipette process	"Adding and configuring a pipette process task" on page 226
Creating protocol basics	"Workflow for creating a protocol" on page 163
Setting pipette task parameters	"Setting pipette task parameters" on page 173

Setting Dispense pipette task parameters

About this topic

This topic describes how to set the Dispense task parameters for a Velocity11 VPrep instrument.

Dispense pipette task defined

A Dispense pipette task is used with a VPrep to dispense liquid into a plate.

Dispense value limits

You cannot dispense more volume than you aspirated.

If you enter a total dispense volume that is greater than the total aspirate volume you will get an error message when you compile the protocol. More specifically, the Aspirate Volume + Pre-Aspirate Volume + Post-Aspirate Volume must be greater than, or equal to, the Dispense Volume + Blowout Volume + Post Dispense Volume.

Before you start

Before you can set the Dispense pipette task parameters, you need to associate a VPrep shelf with the labware type from which you will aspirate.

Procedure

To set Dispense pipette task parameters:

1. In the pipette process window, click the **Dispense** pipette task icon.
2. If you have defined a liquid class for the liquid you intend to dispense, select it from the **Liquid class** list box at the bottom of the **Pipette Task Parameters** toolbar.
3. Either:
   - Type the volume that you want to move out of each pipette tip in the **Dispense Volume** text box.
   - Select the **Empty tips** check box.

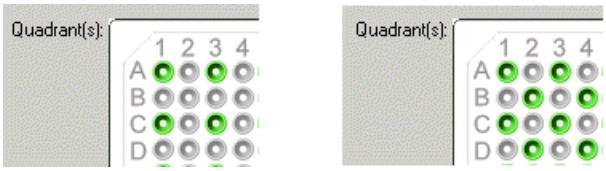
     You may need to drag the toolbar to widen it so you can see the check box. Select this option if you want to empty the tips rather than deliver a specific volume of liquid.
4. Complete the remaining fields:

Field	Description
Dispense velocity	The rate at which to dispense the liquid. If you selected a liquid class, this value is entered automatically from the liquid library editor and cannot be edited here.

Field	Description
Dispense acceleration	The rate of increase in velocity before the Dispense Velocity is reached. If you selected a liquid class, this value is entered automatically from the liquid library editor and cannot be edited here.
Distance from well bottom	The distance between the bottom of the pipette tips and the bottoms of the plate wells or MicroWash tray chimneys. If you are using dynamic tip retraction this value sets the lowest point to which the tips will travel.
Retract distance	The distance that the tips should move upwards per unit volume of liquid being dispensed. This value allows the tips to move upwards during dispensing to maintain a certain height above the surface of the liquid. You will need to determine an appropriate value by trial-and-error for each type of plate you use. You might want this value to be the same as the Tip Retract Distance for the Aspirate pipette task.
Blowout volume	The volume of air to blow out when the tips are in the liquid. This is typically the same as the pre-aspirate volume. *Note:* Blowout only occurs in the last quadrant dispensed into for a given Dispense task.
Post-dispense volume	The volume of air to blow out when the tips are out of the liquid.

5. If the VPrep head has fewer tips than the plate has wells, select a quadrant configuration from the **Quadrant(s)** diagram to indicate which well quadrant of the plate you want to dispense to.

   To select a quadrant, click a representative well. Two possible examples are shown below.



6. If you want the tips to touch one or more sides of the plate wells:
   a. Select the **Enable tip touch** check box.
   b. Type a value for the **tip touch rise height**.

      This is the height that the tips should move upwards before touching the side of the wells.
   c. Type a value for the **Tip touch horiz distance**.

      When the value for this parameter is zero, the tips will move horizontally one well radius. The well radius is defined in the labware database for the type of plate you are using. If you want the tips to touch harder, increase this value. If you want the tips to touch more lightly, enter a negative value.
   d. In the **Number of sides to touch** text box, type a value for number of sides of the wells that you want the tips to touch.
7. In the **Plate to dispense to** list box, select the plate or device to dispense to.
8. If you do not want to record this dispense in the transfer log, clear the **Record in transfer log** check box.

   You might do this, for example, if you are running a casual test protocol.

Related information

For more information about...	See...
Creating a pipette process	“Adding and configuring a pipette process task” on page 226
Creating protocol basics	“Workflow for creating a protocol” on page 163
Setting pipette task parameters	“Setting pipette task parameters” on page 173

Setting Dry Tips pipette task parameters

About this topic

This topic describes how to set the Dry Tips task parameters for a Velocity11 VPrep.

Dry Tips pipette task defined

The Dry Tips task is used with a tip dryer on a VPrep with a fixed-tip head to dry the pipette tips.

There are two phases to drying:

- ❑ Initial

  Rapidly raises the temperature from ambient to a temperature suitable for drying.

- ❑ Final

  Maintains a suitable drying temperature.

The goal when setting Dry Tips task parameters is to raise the temperature quickly for a short time and then apply less heat to dry the tips.

Procedure

To set Dry Tips task parameters:

1. Complete the following:

Parameters	Description
Initial heat	Percentage of the maximum heat.
Initial heat time	Time for which to apply the initial heat.
Final heat	Percentage of the maximum heat.
Final heat time	Time for which to apply the final heat, starting when the initial heat time ends.

Related information

For more information about...	See...
Creating a pipette process	"Adding and configuring a pipette process task" on page 226
Creating protocol basics	"Workflow for creating a protocol" on page 163
Setting pipette task parameters	"Setting pipette task parameters" on page 173

Setting Fill Plate pipette task parameters

About this topic

This topic describes how to set the Fill Plate pipette task parameters for a Velocity11 VPrep.

Fill Plate pipette task defined

This task allows you to configure fluid transfer from a source reservoir to a series of columns or quadrants of a microplate all within a single task. The setting of the fill parameters is done using a wizard which guides you through the setup process.

When to use

The purpose of the Fill Plate pipette task is to facilitate the use of the Serial Dilution task. The Serial Dilution task uses a plate whose wells are filled with a fixed volume of diluent. If you are using an 8- or 16-channel head, this would require a large number of transfer motions to fill the dilution wells with diluent.

With the Fill Plate pipette task, you are able to:

- ❑ Aspirate a large volume from one source (such as a reservoir) and dispense small volumes into multiple columns or quadrants of wells
- ❑ Aspirate a small volume from multiple columns or quadrants of wells and dispense a large volume into one destination (such as waste).
- ❑ Wash or change tips between transfers

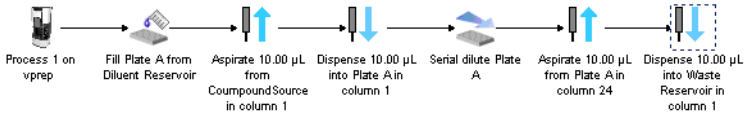
Before you start

Before you start, make sure you have the following ready:

- ❑ Source plate
- ❑ Destination plate
- ❑ Microwash reservoir, if using
- ❑ Tip box, if using

Example

An example of a Fill Plate pipette task, used with a Serial Dilution task is shown:


Process 1 on vprep
Fill Plate A from Diluent Reservoir
Aspirate 10.00 µL from CoumpoundSource in column 1
Dispense 10.00 µL into Plate A in column 1
Serial dilute Plate A
Aspirate 10.00 µL from Plate A in column 24
Dispense 10.00 µL into Waste Reservoir in column 1

A 96-well serial dilution plate (Plate A) enters the pipette process as an empty plate.

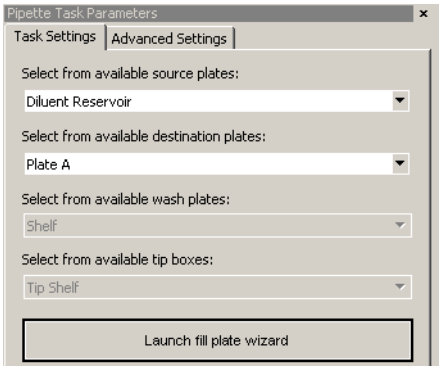
1. Columns 2–12 are filled with a specified amount of diluent by the Fill Plate pipette task.
2. The compound source is taken from a reservoir and dispensed into column 1 of Plate A.
3. A Serial Dilution task is performed on Plate A.

4. Excess volume from column 12 is transferred to waste.

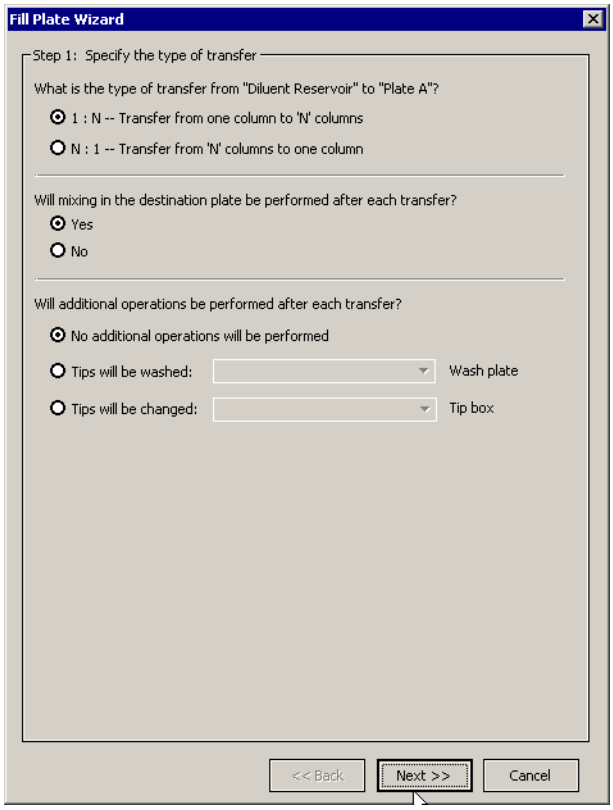
Procedure

To set the Fill Plate pipette task parameters:

1. Drag the **Fill Plate** pipette task icon from the **Pipette Task** list in the **Pipette Process Editor** to the desired position in the pipette process.
2. In the **Pipette Task Parameters** toolbar, select the reservoir or plate that has the diluent source from the **available source plates** list.



3. Select the destination plate (usually the serial dilution plate) for the diluent from the **available destination plates** list.
4. If you are washing tips, and you have more than one washing location, select the wash source from the **available wash plates** list.
5. If you are changing tips during the fill task, and you have more than one tip box location, select the tip box source from the **available tip boxes** list.
6. Click **Launch fill plate wizard**.
7. Configure the type of transfer.


Fill Plate Wizard
Step 1: Specify the type of transfer
What is the type of transfer from "Diluent Reservoir" to "Plate A"?
1 : N -- Transfer from one column to 'N' columns
N : 1 -- Transfer from 'N' columns to one column
Will mixing in the destination plate be performed after each transfer?
Yes
No
Will additional operations be performed after each transfer?
No additional operations will be performed
Tips will be washed:
Wash plate
Tips will be changed:
Tip box
<< Back
Next >>
Cancel

a. Choose the type of transfer:

   1:N type of transfer removes fluid from a reservoir and dispenses it to 'N' columns or quadrants of a destination plate

   N:1 type of transfer removes fluid from 'N' columns or quadrants and dispenses it to a single location (such as waste).

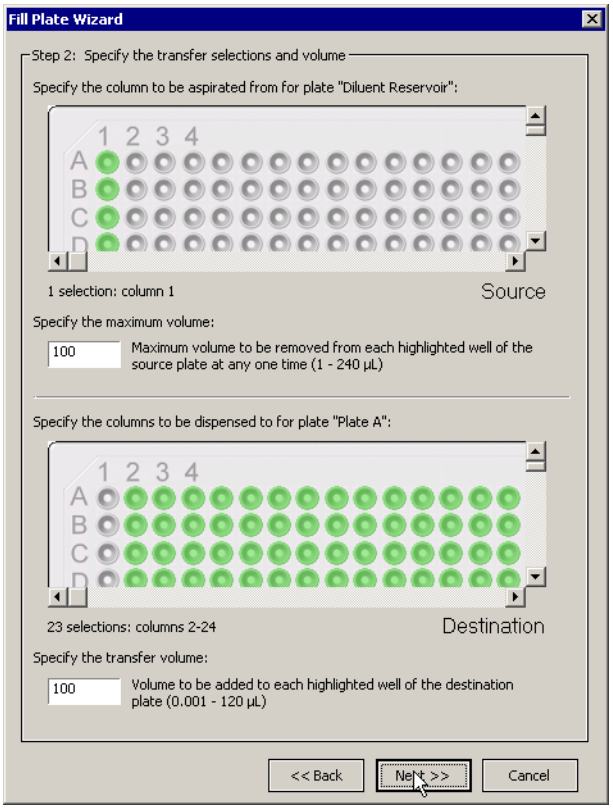
b. Choose whether or not to perform mixing after each transfer.

c. If you are washing tips, select **Tips will be washed** and then choose the **Wash plate** from the list box.

d. If you are changing tips, select **Tips will be changed** and then choose the **Tip box** from the list box.

   Note: Tip changing can only be performed if you are using a disposable tip head.

8. Click **Next** to go to step 2 of the **Fill Plate Wizard** and assign source and destination locations and volume to transfer.


Fill Plate Wizard
Step 2: Specify the transfer selections and volume
Specify the column to be aspirated from for plate "Diluent Reservoir":
1 2 3 4
A
B
C
D
1 selection: column 1
Source
Specify the maximum volume:
100
Maximum volume to be removed from each highlighted well of the source plate at any one time (1 - 240 µL)
Specify the columns to be dispensed to for plate "Plate A":
1 2 3 4
A
B
C
D
23 selections: columns 2-24
Destination
Specify the transfer volume:
100
Volume to be added to each highlighted well of the destination plate (0.001 - 120 µL)
<< Back
Next >>
Cancel

a. Enter a value in the **Specify the Maximum volume** field. This is the maximum amount that will be aspirated at any one time from the source (in a 1:N transfer) or dispense at any one time to the destination (N:1).

   The upper limit of this value is determined by the following:

- Capacity of the pipette head
- Capacity of the tips, if **Tips will be changed** was selected in step 1 of the Fill Plate Wizard.
- Well volume of the source plate (in a 1:N transfer) or the destination plate (in a N:1 transfer).

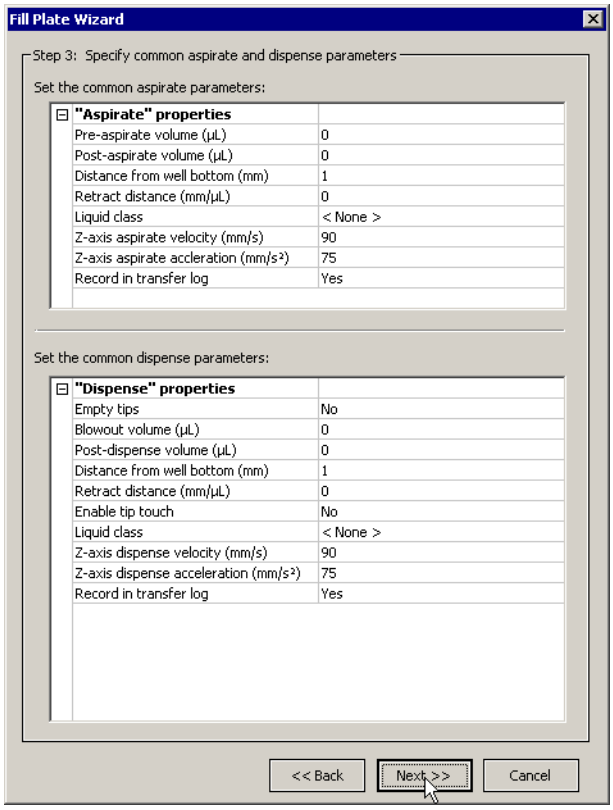
b. Enter a value in the **Specify the transfer volume** field. This is the volume to be added to each column or quadrant of the destination (in a 1:N transfer) or removed from each column or quadrant of the source (in a N:1 transfer).

   The upper limit is determined by the well volume of the destination (in a 1:N transfer) or the source (in a N:1 transfer).

   The following table describes the fill plate pipette tasks associated with three different types of transfer in which fluid aspirated from a single column of the source is dispensed into five columns of the destination (1:N transfer).

Volumes	Resulting aspirate/dispense task pattern
Max volume = 50 µL Transfer = 10 µL	A single Aspirate task which removes 50 µL from the source and a single Dispense task which dispenses 10 µL to five columns.
Max volume = 10 µL Transfer = 10 µL	Five Aspirate tasks interleaved with five Dispense tasks, each using 10 µL.
Max volume = 10 µL Transfer = 50 µL	Twenty-five Aspirate tasks interleaved with 25 Dispense tasks, each task using 10 µL.

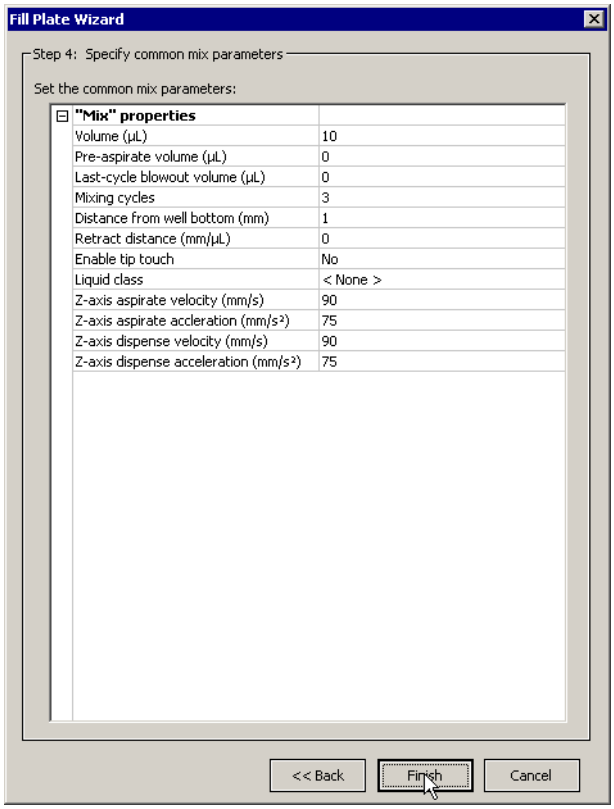
9. Click **Next** to go to step 3 of the **Fill Plate Wizard** and specify the aspirate and dispense properties.


Fill Plate Wizard
Step 3: Specify common aspirate and dispense parameters
Set the common aspirate parameters:
"Aspirate" properties
Pre-aspirate volume (µL) 0
Post-aspirate volume (µL) 0
Distance from well bottom (mm) 1
Retract distance (mm/µL) 0
Liquid class < None >
Z-axis aspirate velocity (mm/s) 90
Z-axis aspirate accleration (mm/s²) 75
Record in transfer log Yes
Set the common dispense parameters:
"Dispense" properties
Empty tips No
Blowout volume (µL) 0
Post-dispense volume (µL) 0
Distance from well bottom (mm) 1
Retract distance (mm/µL) 0
Enable tip touch No
Liquid class < None >
Z-axis dispense velocity (mm/s) 90
Z-axis dispense acceleration (mm/s²) 75
Record in transfer log Yes
<< Back
Next >>
Cancel

   a. Enter the desired values for the **Dispense** and **Aspirate** tasks that will take place during the **Fill Plate** pipette task.

      Note: These values are applied to all **Aspirate** and **Dispense** tasks that occur within the **Fill Plate** pipette task. The **Volume** and **Well selection** fields are not available because this information was entered in step 2 of the wizard.

10. If the mixing option in step 1 of the **Fill Plate Wizard** was selected, click **Next** to go to step 4 of the **FIll Plate Wizard** and specify mix properties.



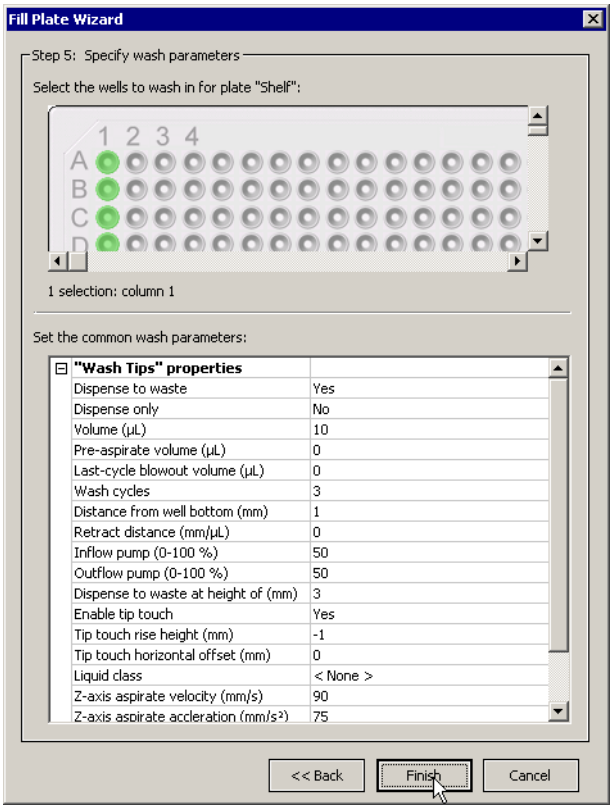
a. Enter the desired values for the **Mix** task that will take place during the **Fill Plate** pipette task.

   Note: The **Well selection** field is not available because this information was entered in step 2 of the wizard.

   The following table describes how a **Mix** task would be executed when associated with three different types of transfer in which fluid aspirated from a single column of the source is dispensed into five columns of the destination (1:N transfer).

Volumes	**Resulting Mix tasks**
Max volume = 50 µL Transfer = 10 µL	A single Mix task after the Dispense task. The Mix task will mix each of the five columns.
Max volume = 10 µL Transfer = 10 µL	Five Mix tasks will be interleaved with the five Aspirate and Dispense tasks.
Max volume = 10 µL Transfer = 50 µL	Five Mix tasks will be interleaved with the 25 Aspirate and Dispense tasks. After each destination column has received 50 µL, that column will be mixed.

11. If the tip washing option in step 1 of the **Fill Plate Wizard** was selected, click **Next** to go to step 5 of the **Fill Plate Wizard** and specify wash properties.

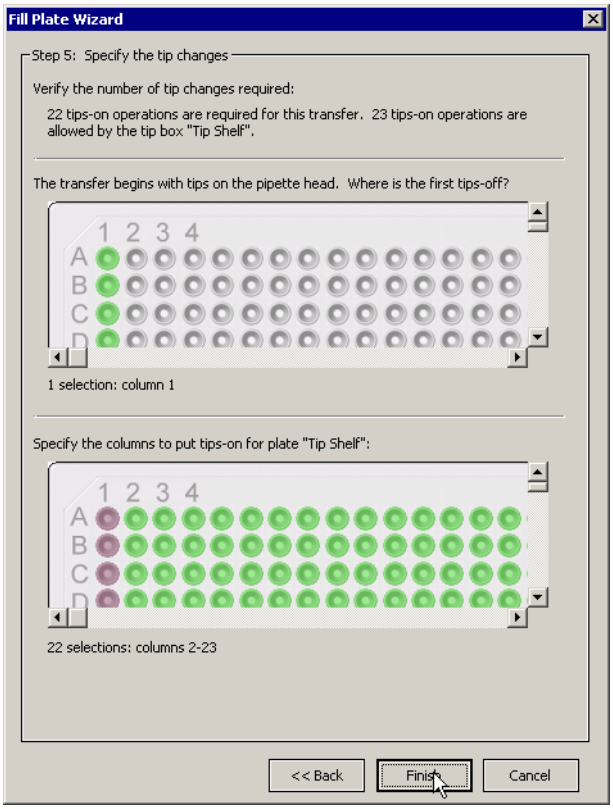


a. Select one column or quadrant from the wash plate in which to wash and enter the desired wash parameters.

   The following table describes how a **Wash** task would be executed when associated with three different types of transfer in which fluid aspirated from a single column of the source is dispensed into five columns of the destination (1:N transfer).

Volumes	**Resulting Wash tasks**
Max volume = 50 µL Transfer = 10 µL	A single Wash task is executed after the Dispense task.
Max volume = 10 µL Transfer = 10 µL	Five Wash tasks will be interleaved with the five Aspirate and Dispense tasks.
Max volume = 10 µL Transfer = 50 µL	Five Wash tasks will be interleaved with the 25 Aspirate and Dispense tasks. After each destination column has received 50 µL, washing will occur.

12. If the tip changing option in step 1 was selected, click **Next** to go to step 5 of the **FIll Plate Wizard** and specify tip changes.


Fill Plate Wizard
Step 5: Specify the tip changes
Verify the number of tip changes required:
22 tips-on operations are required for this transfer. 23 tips-on operations are allowed by the tip box "Tip Shelf".
The transfer begins with tips on the pipette head. Where is the first tips-off?
1 2 3 4
A
B
C
D
1 selection: column 1
Specify the columns to put tips-on for plate "Tip Shelf":
1 2 3 4
A
B
C
D
22 selections: columns 2-23
<< Back
Finish
Cancel

For tip changing, the **Fill Plate** pipette task assumes that the task begins with clean tips on the pipette head and that the **Fill Plate** pipette task will end with dirty tips on the pipette head.

The required number of tip changes and the number of possible tip changes is displayed at the top of the dialog box.

a. Select the column or quadrant where the first tips off will occur.

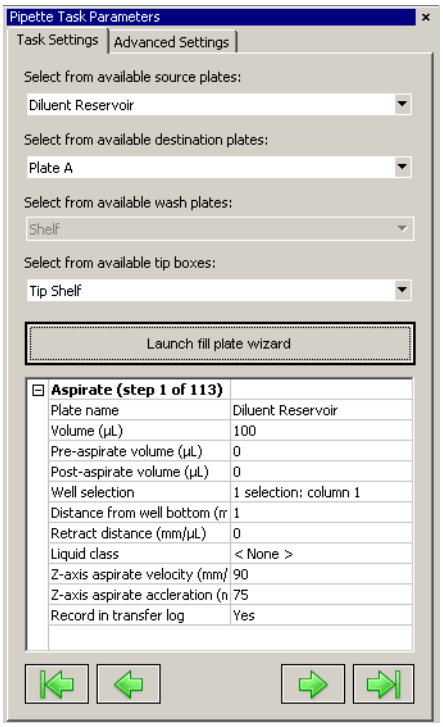
b. Select the columns or quadrants where the pipette head will load tips on.

   Note: The execution of tip changing is similar to that of tip washing.

13. Click **Finish**.

    The **Pipette Task Parameters** toolbar displays the properties of the first step in the **Fill Plate** pipette task.

    Arrows at the bottom of the toolbar are enabled. Use these to scroll through each step of the **Fill Plate** pipette task.



Executing the Fill Plate pipette task

VWorks treats the Fill Plate pipette task as a series of Aspirate, Dispense, and Change or Wash tips tasks. In the example shown here, a single Fill Plate pipette task is actually comprised of 113 tasks. These 113 tasks are also recorded as such in the Process and Error log files.

Related information

For information about...	See...
Configuring a pipette process	"Configuring a pipette process: example" on page 222 "Adding and configuring a pipette process task" on page 226
Using the Serial Dilution task	"Setting Serial Dilution task parameters" on page 253
Configuring a VPrep shelf	"Workflow for configuring a VPrep shelf" on page 141

Setting Loop pipette task parameters

About this topic

This topic describes how to set the Loop task parameters for a Velocity11 VPrep. This is illustrated with an example in which an Aspirate/Dispense pair of tasks is looped four times.

Loop task defined

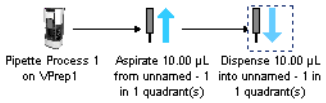
The Loop pipette task allows you to repeat a set of tasks within a process.

Procedure

To set Loop pipette task parameters:

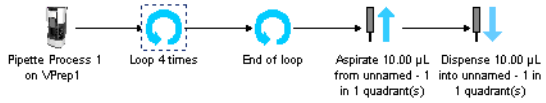
1. Open the **Pipette Process Editor** to display the process in which you want to add the **Loop** pipette task.

   An example is shown below.

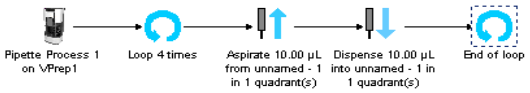


2. In the pipette process window, click to select the **Loop** pipette task icon and drag it into the process in front of the first task that you want to be in the loop.

   A **Loop** pipette task icon and **End of loop** pipette task icon are added to the process.


Pipette Process 1 on VPrep1
Loop 4 times
End of loop
Aspirate 10.00 µL from unnamed - 1 in 1 quadrant(s)
Dispense 10.00 µL into unnamed - 1 in 1 quadrant(s)

3. Drag the **End of loop** pipette task icon to the other side of the last task you want to be in the loop.


Pipette Process 1 on VPrep1
Loop 4 times
Aspirate 10.00 µL from unnamed - 1 in 1 quadrant(s)
Dispense 10.00 µL into unnamed - 1 in 1 quadrant(s)
End of loop

4. Select the **Loop** task pipette icon and in the **Pipette Task Parameters** toolbar, enter the number of times you want the tasks inside the loop to run.

Related information

For information about...	See...
Configuring a pipette process	"Configuring a pipette process: example" on page 222 "Adding and configuring a pipette process task" on page 226
Configuring a VPrep shelf	"Workflow for configuring a VPrep shelf" on page 141
Using the Loop task with the Change Instance pipette task	"Setting Change Instance pipette task parameters" on page 230

Setting Mix pipette task parameters

About this topic

This topic describes how to set the Mix task parameters for a Velocity11 VPrep.

Mix pipette task defined

The Mix pipette task is used with a VPrep to mix reagents by aspirating and then dispensing.

Before you start

Before you start, you must associate a VPrep shelf with the labware you will be using for the aspiration step of the mixing.

Procedure

To set Mix pipette task parameters:

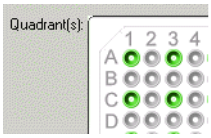
1. In the pipette process window, click to select the **Mix** pipette task icon.
2. If you have defined a liquid class for the liquid you intend to mix, select it from the **Liquid class** list box at the bottom of the **Pipette Task Parameters** toolbar.
3. Complete the following properties:

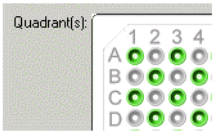
Property	Description
Mixing volume	The volume of liquid to be aspirated and dispensed to each plate well.
Number of mixing cycles	The number of aspirate/dispense operations.
Aspirate velocity	The rate at which to draw up liquid. If you selected a liquid class, this value is entered automatically from the liquid library editor and cannot be edited here.

Property	Description
Aspirate acceleration	The rate of increase in velocity before the maximum aspirate velocity is reached. If you selected a liquid class, this value is entered automatically from the liquid library editor and cannot be edited here.
Dispense velocity	The rate at which to dispense the liquid. If you selected a liquid class, this value is entered automatically from the liquid library editor and cannot be edited here.
Dispense acceleration	The rate of increase in velocity before the Dispense Velocity is reached. If you selected a liquid class, this value is entered automatically from the liquid library editor and cannot be edited here.
Distance from well bottom	The distance between the bottom of the pipette tips and the bottoms of the plate wells or MicroWash tray chimneys. If you are using dynamic tip retraction this value sets the lowest point to which the tips will travel.
Retract distance	The distance that the tips should move upwards or downwards per unit volume of liquid being dispensed or aspirated. This value allows the tips to move upwards or downwards during dispensing or aspirating to maintain a certain height below or above the surface of the liquid. You will need to determine an appropriate value by trial-and-error for each type of plate you use.
Pre-aspirate volume	The volume of air to be drawn up before the pipette tips enter the liquid, and before mixing begins.
Last-cycle blowout volume	The volume of air to blow out when the tips are in the liquid once the mixing is complete. This is typically the same as the pre-aspirate volume.

4. If the VPrep head has fewer tips than the plate has wells, select a quadrant configuration from the **Quadrant(s)** diagram to indicate in which well quadrant of the plate you want to mix.

   To select a quadrant, click a representative well. Two possible examples are shown below.





5. If you want the tips to touch one or more sides of the plate wells:
   a. Select the **Enable tip touch** check box.
   b. Type a value for the **tip touch rise height**.

      This is the height that the tips should move upwards before touching the side of the wells.
   c. Type a value for the **tip touch horizontal distance**.

      When the value for this parameter is zero, the tips will move horizontally one well radius. The well radius is defined in the labware database for the type of plate you are using. If you want the tips to touch harder, increase this value. If you want the tips to touch more lightly, enter a negative value.
   d. In the **Number of sides to touch** text box, type a value for the number of sides of the wells that you want the tips to touch.
6. In the **Plate to mix** list box, select the type of labware or device to mix in.

Related information

For more information about...	See...
Configuring a pipette process	"Adding and configuring a pipette process task" on page 226 "Configuring a pipette process: example" on page 222
Configuring a VPrep shelf	"Workflow for configuring a VPrep shelf" on page 141
Other pipette task parameters	"Setting pipette task parameters" on page 173

Setting Pump Reagent pipette task parameters

About this topic

This topic describes how to set the Pump Reagent task parameters for a Velocity11 VPrep.

Pump Reagent task defined

The Pump Reagent pipette task is used on a VPrep to pump liquid into an installed autofilling reservoir. Reservoirs are typically filled with washing buffer or water, and drained through the gravity drain.

!! IMPORTANT !! If you run an empty reservoir step and a fill reservoir step in the same protocol, check the protocol to make sure that it will not lead to an overflow.

Procedure

To fill a VPrep reservoir:

1. In the **Pipette Process Editor**, click the **Pump Reagent** icon.
2. In the **Pipette Task Parameters** toolbar, select **Fill reservoir**.

   The **Fill reservoir** and **Empty reservoir** values determine whether the pumps will fill or empty the reservoir.

   To empty the reservoir you must complete the **Autofill Configuration** information on the **Shelves** tab of the VPrep Diagnostics.
3. In the list box, select the shelf on which the reservoir is located.
4. In the **for** text box, type the pumping duration.

   This is the time in seconds that the pumps pump.
5. In the **at** text box, type the percentage of maximum pumping rate.

   This, combined with the pumping duration, determines the volume of fluid moved.
6. In the **every** text box, type a number that controls how frequently the liquid is pumped.

   For example, if you type `3`, the pump will run every third time the task runs.
7. If you are using a **WeighShelf**, in the **Min level** text box, enter the minimum percentage of liquid that you want the reservoir to contain.

   A typical value is 45%.
8. If you are using a **WeighShelf**, in the **Max level** text box, enter the maximum percentage of liquid that you want the reservoir to contain.

   A typical value is 60%.

Related information

For more information about...	See...
Configuring a VPrep shelf	"Workflow for configuring a VPrep shelf" on page 141
Using the Fill Plate task	"Setting Fill Plate pipette task parameters" on page 239
Autofill configuration with the VPrep	*VPrep User Guide*

Setting Serial Dilution task parameters

About this topic

This topic describes how to set the Serial Dilution task parameters for a Velocity11 VPrep.

Serial Dilution task defined

The Serial Dilution task allows you to set up a serial dilution on a microplate using a single task. Configuring the Serial Dilution task settings is performed using a wizard which guides you through the setup process. The end result is a series of Aspirate, Dispense, and Mix tasks that produce a linear or non-linear concentration gradient in a selected microplate area.

Pipette head and microplate configurations

The Serial Dilution task can be used with the following head/plate configurations:

- ❑ VPrep 8 channel head with a 96–, 384–, or 1536–well microplate
- ❑ VPrep 16 channel head with 384– and 1536–well microplates
- ❑ VPrep 96 channel head with a 384– and 1536–well microplate
- ❑ VPrep 384 channel head with a 1536–well microplate

Before you start

The Serial Dilution task can only be used with a microplate and not a reagent plate or reservoir.

Before you start, make sure the serial dilution plate has the following:

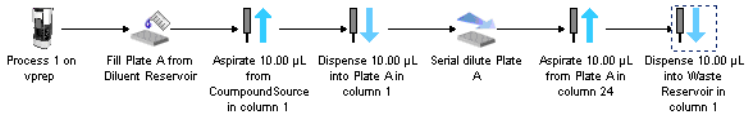
- ❑ A column or quadrant that contains the starting concentration of a compound to be diluted
- ❑ One or more columns or quadrants each containing the same amount of diluent

Example

An example of a simple serial dilution is the following:

A 384-well serial dilution plate (Plate A) enters the pipette process as an empty plate.

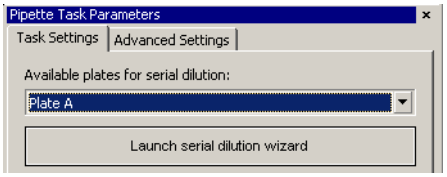
1. Columns 2–24 are filled with a specified amount of diluent.
2. The compound to be diluted is taken from a compound source reservoir and dispensed into column 1 of Plate A.
3. A serial dilution is performed on Plate A and following this, an excess amount from column 24 is transferred to waste.


Process 1 on vprep
Fill Plate A from Diluent Reservoir
Aspirate 10.00 µL from CompoundSource in column 1
Dispense 10.00 µL into Plate A in column 1
Serial dilute Plate A
Aspirate 10.00 µL from Plate A in column 24
Dispense 10.00 µL into Waste Reservoir in column 1

Procedure

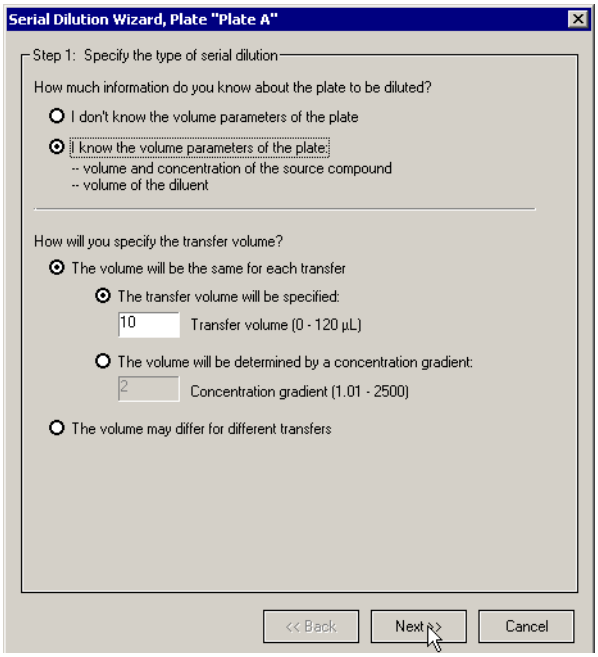
To open the Serial Dilution Wizard:

1. Drag the **Serial Dilution** task icon from the **Pipette Task** list in the **Pipette Process Editor** to the desired position in the pipette process window.
2. In the **Pipette Task Parameters** toolbar, select the dilution plate from the **Available plates for serial dilution** list.



3. Click **Launch serial dilution wizard**.

   The dialog box for step 1, specifying the type of serial dilution opens.


Serial Dilution Wizard, Plate "Plate A"
Step 1: Specify the type of serial dilution
How much information do you know about the plate to be diluted?
I don't know the volume parameters of the plate
I know the volume parameters of the plate:
-- volume and concentration of the source compound
-- volume of the diluent
How will you specify the transfer volume?
The volume will be the same for each transfer
The transfer volume will be specified:
10
Transfer volume (0 - 120 µL)
The volume will be determined by a concentration gradient:
2
Concentration gradient (1.01 - 2500)
The volume may differ for different transfers
<< Back
Next >>
Cancel

4. In step 1 of the **Serial Dilution Wizard**, choose whether or not you want to specify the volume and concentration parameters.

   Specifying these parameters enables you to:

   - Determine the dilution according to a desired concentration gradient. The wizard calculates the necessary transfer volumes.
   - View resultant concentration if you choose to specify volumes.

5. Choose how the transfer volumes will be determined:

   - A fixed transfer volume results in a dilution series whose concentration gradient is linear.
   - A variable transfer volume results in a dilution series whose concentration gradient is non-linear.

6. If you choose a constant transfer volume, then either:

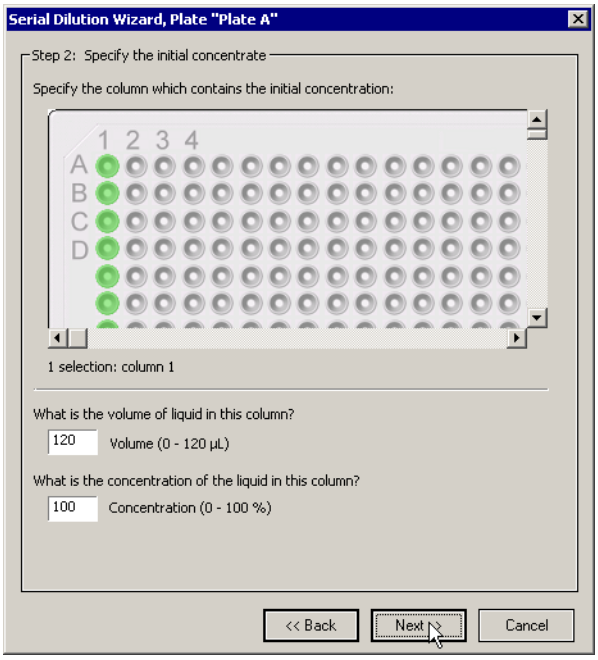
   a. Enter the volume to be transferred in the **Transfer volume** field or,

   b. Select **The volume will be determined by a concentration gradient** and enter the dilution factor in the **Concentration gradient** field.

      For example, if the **Concentration gradient** = 2, then the concentration of the first dilution will be the concentration in the starting column (n) divided by 2, or n/2. The concentration of the second dilution will be the concentration of the second column (n–1) divided by 2, or (n–1)/2 and so forth.

      Note: The upper range of the transfer volume is determined by the capacity of the pipette head and the well volume of the plate.

7. Click **Next** to go to step 2 of the **Serial Dilution Wizard**, and enter information about the initial concentration.

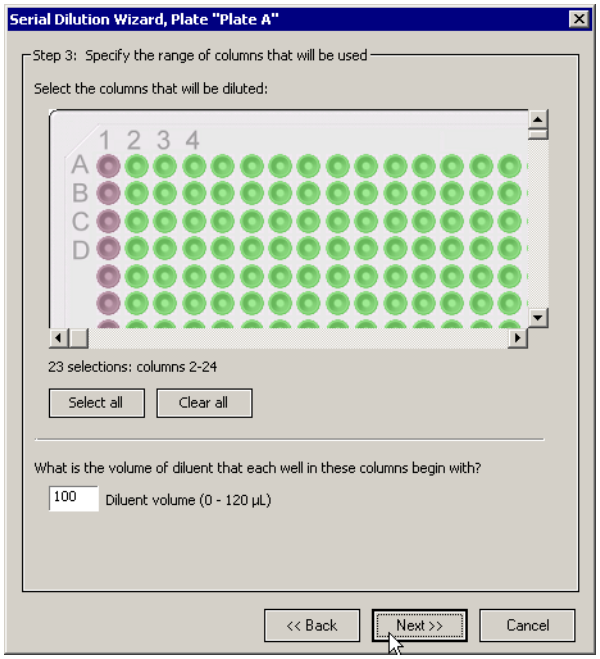


8. Select the column, or quadrant of the plate that contains the starting concentration.

   Note: Only one column or quadrant may be selected.

   If you selected the **I know the volume parameters of the plate** in step 1, then enter the values in the fields for the **Volume** and **Concentration**.

9. Click **Next**, to go to step 3 of the **Serial Dilution Wizard**, and enter information about the dilution wells.

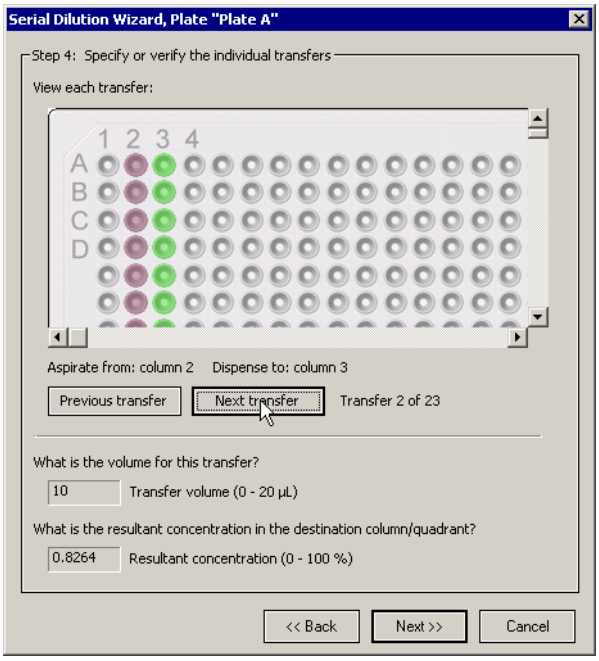


10. Specify the columns, or quadrants of wells that will be used in the dilution.

    Note: The dilution will take place from left to right so only columns located to the right of the starting column and quadrants in 1, 2, 3, 4 order are available. Not all columns or quadrants must be selected.

    If you selected **I know the volume parameters of the plate** in step 1 of the wizard, then enter the volume in each well in the **Diluent volume** field.

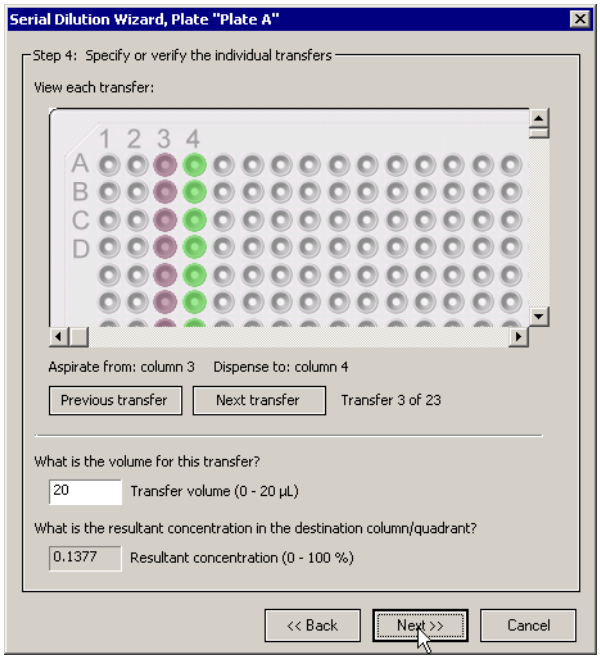
11. Click **Next** to go to step 4 of the **Serial Dilution Wizard**, and enter or view information about the transfers, if applicable.



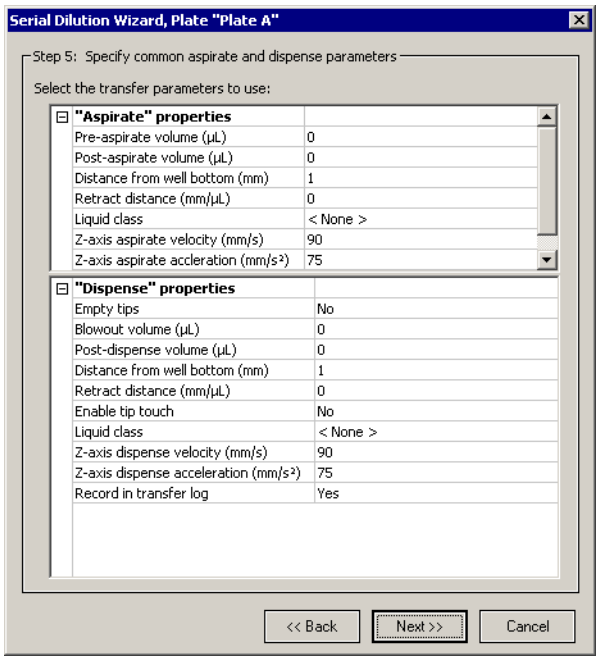
12. If you selected **I know the volume parameters of the plate** in step 1 of the wizard, the final concentration for each dilution step can be viewed in the **Resultant concentration** field.

    To view the information about a particular column, click **Next transfer** or **Previous transfer**.

13. If you selected **Volume may differ for different transfers** in step 1 of the wizard, examine each transfer volume by clicking **Next transfer** and adjust the values in the **Transfer volume** if necessary.



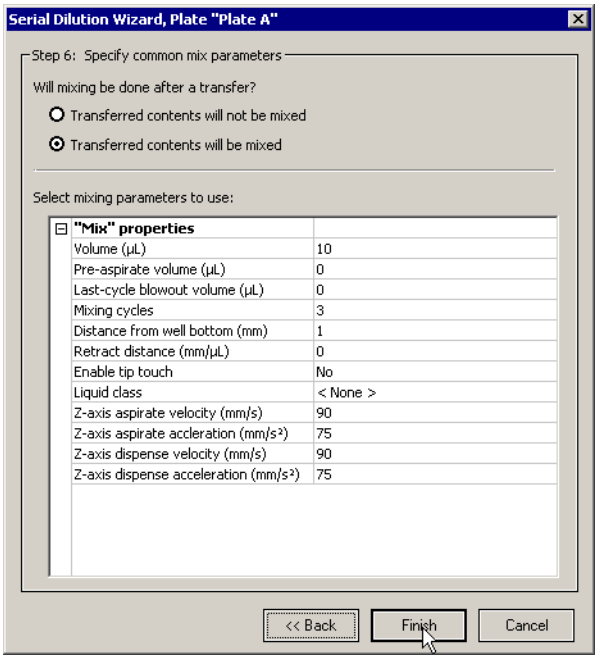
14. Click **Next** to go to step 5 of the **Serial Dilution Wizard**, and enter the aspirate and dispense property parameters for these tasks that occur during the **Serial Dilution** task.


Serial Dilution Wizard, Plate "Plate A"
Step 5: Specify common aspirate and dispense parameters
Select the transfer parameters to use:
"Aspirate" properties
Pre-aspirate volume (µL) 0
Post-aspirate volume (µL) 0
Distance from well bottom (mm) 1
Retract distance (mm/µL) 0
Liquid class < None >
Z-axis aspirate velocity (mm/s) 90
Z-axis aspirate accleration (mm/s²) 75
"Dispense" properties
Empty tips No
Blowout volume (µL) 0
Post-dispense volume (µL) 0
Distance from well bottom (mm) 1
Retract distance (mm/µL) 0
Enable tip touch No
Liquid class < None >
Z-axis dispense velocity (mm/s) 90
Z-axis dispense acceleration (mm/s²) 75
Record in transfer log Yes
<< Back
Next >>
Cancel

15. Enter the desired values for the **Dispense** and **Aspirate** tasks that will take place during the serial dilution process.

    Note: These values are applied to all **Aspirate** and **Dispense** tasks that occur within the **Serial Dilution** task. The **Volume** and **Well selection** fields are not available because this information was entered in steps 2 and 3 of the wizard.

16. Click **Next** to go to step 5 of the **Serial Dilution Wizard**, and enter the mix property parameters for this task that takes place during the **Serial Dilution** task.


Serial Dilution Wizard, Plate "Plate A"
Step 6: Specify common mix parameters
Will mixing be done after a transfer?
Transferred contents will not be mixed
Transferred contents will be mixed
Select mixing parameters to use:
"Mix" properties
Volume (µL) 10
Pre-aspirate volume (µL) 0
Last-cycle blowout volume (µL) 0
Mixing cycles 3
Distance from well bottom (mm) 1
Retract distance (mm/µL) 0
Enable tip touch No
Liquid class < None >
Z-axis aspirate velocity (mm/s) 90
Z-axis aspirate accleration (mm/s²) 75
Z-axis dispense velocity (mm/s) 90
Z-axis dispense acceleration (mm/s²) 75
<< Back
Finish
Cancel

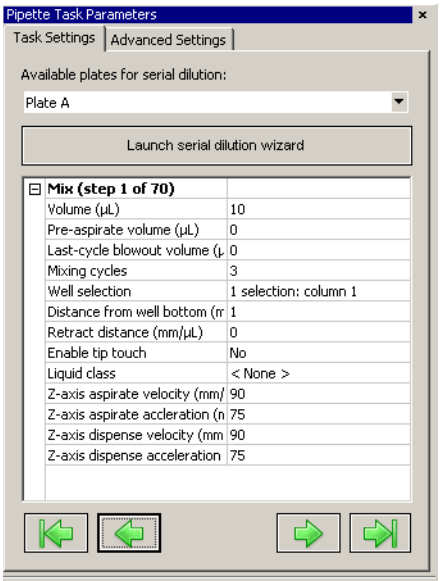
17. Select whether or not you want to mix after each transfer. If you choose to mix, enter the desired values for the **Mix** task that will take place during the serial dilution task.

    Note: The **Well selection** field is not available because this information was entered in a previous step of the wizard.

18. Click **Finish**.

    The **Pipette Task Parameters** toolbar displays the properties of the first step in the **Serial Dilution** task.

    Arrows appear at the bottom of the toolbar. Use these to scroll through each step of the serial dilution.


Pipette Task Parameters
Task Settings
Advanced Settings
Available plates for serial dilution:
Plate A
Launch serial dilution wizard
Mix (step 1 of 70)
Volume (µL) 10
Pre-aspirate volume (µL) 0
Last-cycle blowout volume (µ 0
Mixing cycles 3
Well selection 1 selection: column 1
Distance from well bottom (m 1
Retract distance (mm/µL) 0
Enable tip touch No
Liquid class < None >
Z-axis aspirate velocity (mm/ 90
Z-axis aspirate accleration (n 75
Z-axis dispense velocity (mm 90
Z-axis dispense acceleration 75

Executing the Serial Dilution task

VWorks treats the Serial Dilution task as a series of Mix, Aspirate and Dispense tasks. In the example shown here, the serial dilution of one plate is comprised of 70 Mix, Aspirate and Dispense tasks. These 70 tasks are also recorded as such in the Process and Error log files.

Related information

For more information about...	See...
Using the Fill Plate task in conjunction with the Serial Dilution task	"Setting Fill Plate pipette task parameters" on page 239
Configuring a pipette process	"Adding and configuring a pipette process task" on page 226 "Configuring a pipette process: example" on page 222
Autofill configuration with the VPrep	*VPrep User Guide*

Setting Wash Tips pipette task parameters

About this topic

This topic describes how to set the Wash Tips task parameters for a Velocity11 VPrep instrument.

Wash Tips pipette task defined

A Wash Tips pipette task is used with a VPrep to wash pipette tips.

Before you start

Before you start, you need to have a VPrep shelf associated with the labware type with which you want to wash.

Procedure

To wash pipette tips:

1. If you have defined a liquid class for the liquid you intend to use for washing, select it from the **Liquid class** list box at the bottom of the **Task Parameters** toolbar.
2. Complete the following properties:

Property	Description
Wash Volume	The volume of liquid to be aspirated and dispensed to each plate well.
Dispense only	Select this if you want to dispense the wash liquid to waste instead of dispensing it back into the reservoir of washing liquid. *Note:* The **Dispense to waste at height of** check box must be selected for this option to be available. Enter the amount to dispense in the **Wash Volume** field.
Empty tips	This option is only available if you select **Dispense only**. Select this if you want to empty the tips, regardless of the volume.
Number of wash cycles	The number of aspirate/dispense operations.
Aspirate velocity	The rate at which to draw up the liquid. If you selected a liquid class, this value is entered automatically from the liquid library editor and cannot be edited here.
Aspirate acceleration	The rate of increase in velocity before the aspirate velocity is reached. If you selected a liquid class, this value is entered automatically from the liquid library editor and cannot be edited here.
Dispense velocity	The rate at which to dispense the liquid. If you selected a liquid class, this value is entered automatically from the liquid library editor and cannot be edited here.

Property	Description
Dispense acceleration	The rate of increase in velocity before the dispense velocity is reached. If you selected a liquid class, this value is entered automatically from the liquid library editor and cannot be edited here.
Distance from well bottom	The distance between the bottom of the pipette tips and the bottoms of the MicroWash tray chimneys.
Retract Distance	The distance that the tips should move upwards or downwards per unit volume of liquid being dispensed or aspirated. This value allows the tips to move upwards or downwards during dispensing or aspirating to maintain a certain height below or above the surface of the liquid. You will need to determine an appropriate value by trial-and-error.
Pre-aspirate volume	The volume of air to be drawn up before the pipette tips enter the liquid, and before mixing begins.
Last-cycle blowout volume	The volume of air to blow out when the tips are in the liquid once the mixing is complete. This is typically the same as the pre-aspirate volume.

3. If the VPrep head has fewer tips than the plate has wells, select a quadrant configuration from the **Quadrant(s)** diagram to indicate which well quadrant of the plate you want to dispense to.

   To select a quadrant, click a representative well. Two possible examples are shown below.

4. Type a value for the **Inflow pump**, which is the relative rate of liquid flow into the MicroWash tray manifold.

   This value should be high enough for the washing liquid to just bubble over the tops of the chimneys.

5. Type a value for the **Outflow pump**, which is the relative rate of liquid flow out of the MicroWash tray manifold.

   This value should be zero.

6. If you want to dispense the wash liquid to waste instead of dispensing it back into the reservoir of washing liquid:

   a. Select the **Dispense to waste at height of** check box.

b. Type a value into the associated text box for the height above the chimney from which you want the liquid to be dispensed.

The value can be a positive or negative number.

The pipette tips move up and sideways to dispense the wash liquid between the chimneys into waste.

7. If you want the tips to touch the outside tops of the chimneys to remove drops from the tips:

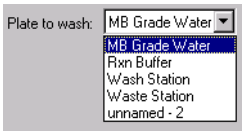
a. Select the **Enable tip touching** check box.

This is the height that the tips should move upwards before touching the side of the wells.

b. Type a value for the **Tip touch horizontal distance**.

When the value for this parameter is zero, the tips will move horizontally one well radius. The well radius is defined in the labware database for the type of plate you are using. If you want the tips to touch harder, increase this value. If you want the tips to touch more lightly, enter a negative value.

8. In the **Plate to wash** list box, select the VPrep and shelf position of the MicroWash tray.



If the name that you chose does not appear in this list, you probably associated the VPrep shelf with the labware type *after* adding the Wash tips pipette task to the pipette process. Remove the task and add it again for the choice to appear.

Washing the MicroWash tray manifold

To wash the MicroWash tray manifold:

1. Create a process that contains only a pipette process.
2. Add a **Wash Tips** task to the pipette process.
3. Enter the following values for the task:

Property	Value
Wash volume	0
Number of wash cycles	0
Inflow pump	Typically set below 100%. The actual rate of inflow depends on the viscosity of the liquid and the height of the reservoir above the Microwash tray. It is best to observe the height of the fluid in the tray and set the inflow pump value so that there is an even flow of liquid and the height does not rise to cause an overflow.
Outflow pump	Typically set to 100%

4. Run the process.

Related information

For more information about...	See...
Creating a liquid class	“Creating a liquid class” on page 364
Associating a VPrep shelf with labware	“Configuring a pipette process: example” on page 222
Configuring a pipette process	“Adding and configuring a pipette process task” on page 226 “Configuring a pipette process: example” on page 222

Creating a protocol: advanced topics

11

This chapter is for people with Technician or Administrator privileges. It provides the background information necessary to set up certain tasks.

Before reading this chapter you should be familiar with the concepts presented in the following chapters:

- "Creating a protocol: basics" on page 161
- "Setting task parameters for Velocity11 devices" on page 183
- "Setting VPrep pipette task parameters" on page 221

Note: The chapter is not a tutorial on writing protocols—it provides the basic reference information you need to write protocols.

Setting up a pre- or post-protocol process

About this topic

This topic describes how to set up a pre- or post-protocol process.

Pre-protocols are processes that are carried out once, before the protocol is executed.

Post-protocols are processes that are carried out once, after the protocol is executed.

When to use

Use the pre-protocol editor when you want a task performed one time before the protocol runs. For example, if you are dispensing reagents, you may want to prime a pump with fluid.

Use the post-protocol editor when you want to perform a task one time after the protocol runs. For example, you may want to purge lines with a buffer or cleaning agent.

Procedure

To set up a pre- or post-protocol process:

1. Click the **Pre-Protocol Editor** or the **Post-Protocol Editor** tab.

   If the tab is not available:

   a. Click **Tools** and select **Options**.

   b. Select the **Show Pre/Post Protocol Editor** check box.

   c. Click **OK**.

2. Click **Add**.

   A pre-protocol process icon appears in the **Pre-Protocol Editor** or the **Post-Protocol Editor** window.

3. If the **Task Parameters** toolbar is not showing, click **View** and select **Toolbars > Protocol Parameters**.
4. Type in a name for the process in the **Process name** field.
5. Create the pre-protocol process as you would a protocol process, by adding tasks and then setting the task parameters.
6. When you are finished, compile and check your pre- or post-protocol.

Related information

For information about...	See...
Creating a protocol process	"Workflow for creating a protocol" on page 163
Compiling a protocol	"Compiling protocols" on page 179
Running a protocol in simulation mode	"Simulating a run" on page 181
Running scripts before or after protocols	"Using start/finish protocol scripts" on page 55

Using JavaScript in VWorks

About this topic

This topic introduces how JavaScripts can be used in VWorks.

About JavaScript in VWorks

In VWorks, JavaScript programs (scripts) can be used to:

- ❑ Configure tasks in ways that task parameters do not allow
- ❑ Change the parameters of a protocol task immediately before it is scheduled

This extends the capability of VWorks because the parameters can be changed dynamically during a run, based on:

- ❑ Information passed from an external source, such as a database
- ❑ The number of times the protocol has cycled
- ❑ Feedback on changing conditions during the run

Scripts can be run as part of pre-protocols, protocols, and post-protocols.

About JavaScript

JavaScript is a general-purpose programming language that requires an interpreter to run its programs.

You are probably most familiar with JavaScript where it is used to create dynamic effects in Web pages. The form of JavaScript is made up of a core language plus Web browser-specific language. It is processed by the JavaScript interpreter that is built into modern browsers.

The core JavaScript language can be used to write scripts that have nothing to do with web pages. These scripts can be used for any application that includes a JavaScript interpreter. VWorks is an example of such an application—it uses a JavaScript 1.5 interpreter.

JavaScript resources

There are many JavaScript resources available online and in print. If you want to learn more about JavaScript for use in VWorks, look for resources that cover the core JavaScript language separately from the browser, client-side language and Document Object Model.

Web References

You can find useful information at:

http://www.mozilla.org/js/

Print Reference

A good print reference is *JavaScript: The Definitive Guide*, Fourth Edition, published by O'Reilly.

Examples of use

You can use JavaScript to:

- ❑ Print the parameters of a task to the VWorks log
- ❑ Run a command line that launches an external application, such as a batch file or database updating program
- ❑ Simplify protocol writing, for example, by incrementing pipetting volumes each cycle of a protocol to perform a dilution series

Where scripts are written

Scripts can be written in two *places*:

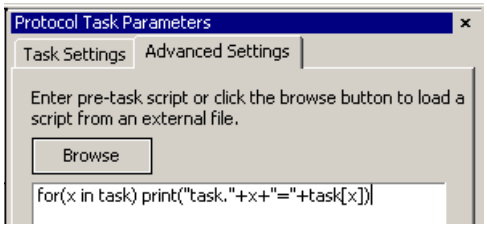
- ❑ Pre/post protocol scripts
- ❑ The Advanced Settings tab

Scripts can be written in two *ways*:

- ❑ Directly into the text box
- ❑ As an external file that is located by clicking Browse

Note: You can also call an external file by embedding the `"open()"` function in the text box.

The following screenshot shows a short script that prints the parameters of a task to the log toolbar, just before the task runs. In this case, the script is written directly in the Advanced Settings text box.


Protocol Task Parameters
Task Settings
Advanced Settings
Enter pre-task script or click the browse button to load a script from an external file.
Browse
for(x in task) print("task."+x+"="+task[x])

About VWorks-defined functions and objects

The VWorks interpreter supports the JavaScript 1.5 core functions and objects. Velocity11 has also defined its own functions and objects that can be used in VWorks scripts.

VWorks-defined global functions

The following VWorks-defined functions are available globally, meaning that they are not restricted to a particular object or programming context.

Function	Description
print()	Prints time-stamped messages to the VWorks log. Parameter: Text string Example: `print(plate.name)`
open()	Opens a file. Parameter: Text string Example: `open("c:\VWorks workspace\text.txt")`
run()	Runs a program as though it is being called from a command line. Parameters: ❑ Text string. Required. Allows you to initiate a command that you could otherwise enter into the Windows Run dialog box, such as `notepad text.txt` (opens a file named text.txt in Windows Notepad). ❑ Boolean True/False. Optional. Default is False. If True, VWorks waits for the function to complete before continuing (blocking).

VWorks-defined objects

The VWorks JavaScript interpreter provides two objects that can be accessed by a script. They are the plate object and task object.

Plate object

The plate object provides access to properties of the plate that the current task is operating upon.

Properties

The plate object has the following properties:

Property	Data type	Description
plate.name	String	Name of the plate.
plate.instance	Integer	Plate instance number.
plate.labware	String	Name of the labware type.

Property	Data type	Description
plate.barcode	Array	Array of four strings corresponding to SOUTH=0, WEST=1, NORTH=2, EAST=3. Example: `plate.barcode[SOUTH] = "mybarcode"`
plate.volume	Array of arrays	An array of floating point numbers. The array size depends on the number of wells in the labware (96, 384, or 1536), arranged in row, column format. This property is only enabled on VWorks systems that have the volume-tracking database option.

Methods

Methods are JavaScript functions invoked through an object.

The plate object has the following methods, available on those systems with the volume-tracking database option.

Method	Comments
plate.setUserData(string key, string value)	Stores 'value' under the key 'key' in a database record associated with this plate
plate.getUserData(string key)	Returns the 'value' stored earlier using plate.setUserData

Task object

The task object is a VWorks-defined generic object that refers to the currently executing task. It allows the properties of the task to be accessed using a standard syntax. Depending on which task is executing, a different set of properties may be available.

Properties

The task object provides a comprehensive set of properties that can be read/write, or read-only. These properties specifically affect the behavior of the task that is about to be executed by the VWorks scheduler.

For example, the Aspirate task has a property called "volume". To store this property in a variable you would write:

```
x = task.volume
```

To set the volume property of the Aspirate task to the value stored in the variable 'x', you would write:

```
task.volume = x
```

In this example, the run-time interpreter determines through the context that 'task.' refers to the currently executing Aspirate task.

Attempting to access properties that are inappropriate for the current task will result in a scripting syntax error, but will not halt the execution of your protocol.

Methods

The task object has the following methods:

Method	Comments

task.skip()	Skips execution of the current task. Use this function to conditionally execute a task, such as in this example which skips the task if the simulator is not running:
	`if (!isSimulatorRunning())`
	`task.skip()`

task.pause()	Pauses the protocol and opens a dialog box that asks you whether you want to continue or abort the run. Use this function if you need to pause the protocol to, for example, replenish the fluid in a static reservoir. You could use the print() function to add a note to the log toolbar describing the action to take when the VWorks has paused.
task.isSimulatorRunning()	Returns true if this is a simulated run. Has no arguments.
task.repeat()	Schedules the task to be repeated.

None of the task object methods accept any parameters.

These are generic methods that are the same regardless of the task that is executing them. The properties of these methods are specific to the current task.

About variables

The default behavior of VWorks JavaScript is that the values of all variables are cleared (set to undefined) before the next protocol is run.

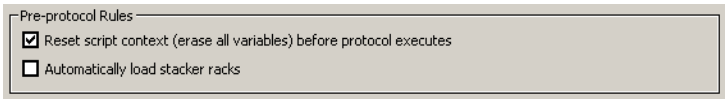
You have the option to change this so that the value of a variable assigned in a script is held in memory until VWorks is closed. This means that if you assign the value to a variable in one protocol, the same value will be used in the next protocol with the same variable. This is the reset script context feature.

To clear the reset variables default option:

1. Select **Tools** > **Protocol Options**.

   The **Protocol Options** dialog box opens.

2. In the **Pre-Protocol Rules** group box, clear the **Reset script context (erase all variables) before protocol executes** check box.


Pre-protocol Rules
Reset script context (erase all variables) before protocol executes
Automatically load stacker racks

Quadrant representation

In JavaScript, an array is a built-in object that stores a collection of like values, called elements. Each element is accessed by an index value that is enclosed in square brackets. Index values can be non-negative integers or strings.

The following example script declares an array with three elements:

```
var vehicle_type = new Array(3);
vehicle_type[0] = "car";
vehicle_type[1] = "truck";
vehicle_type[2] = "van";
```

Because a plate is already an array of wells, locations on plates (quadrants) are represented in Velocity11 JavaScript as an array of arrays. for example, the quadrant property of the task object for one task is represented as:

```
[[1,1]]
```

In this representation, the first number refers to the plate row and the second number refers to the plate column. These numbers can be represented by variables in a script, as shown in the following statement.

```
task.quadrants = [[disp_row,disp_column]]
```

For two quadrants, the representation would be:

```
[[1,1],[1,2]]
```

Cautions

When you run a script that dynamically changes the values of task properties, there is a risk that a value will be set that causes a problem. We therefore recommend that before using a script, you run the simulator with each set of values that will be set by the script. Running scripts cannot cause robot crashes, because scripts cannot modify teachpoints. However, an incorrect task.tipOffset property (Distance from well bottom parameter) on a VPrep could cause the pipette tips to crash into the bottom of the wells resulting in loss of sample and damage to plates.

In addition, be aware that when a protocol is being compiled, it uses the values displayed in the Protocol Task Parameters toolbar screen and not the values that will be set by any scripts. This means that there may be errors in the protocol that are not detected during compilation. The values that appear in the Task Parameter toolbar do not change to reflect the effect of any script.

Also, scripts do not check pipetting volumes before the run begins, so you must make sure that the pipetting steps make logical sense. For example, you will not be alerted beforehand if a script will attempt to aspirate 1 mL from a plate well that can only hold 0.5 mL.

Example scripts

Example 1

This script prints the word “hello” to the log toolbar and log.txt file.

```
print("hello");
```

Example 2

This one-line script opens an external file that could contain another script. The new script is run immediately.

```
open("C:\scripts\script1.txt")
```

Example 3

This script prints a list of the properties for the task to the log toolbar. It is an essential part of determining the names of properties when creating JavaScripts.

```
for(x in task) {
   print("task[" + x + "]=" + task[x]);
}
```

Script-writing service

Velocity11 offers a custom script-writing service for VWorks and other applications. Please contact us for more information.

Related information

For information about...	See...
The properties for each available task in VWorks3, version 20	“The JavaScript task object and properties” on page 276

The JavaScript task object and properties

About this topic

The VWorks JavaScript interpreter includes a task object that is defined by Velocity11.

This topic lists the properties for the Velocity11 JavaScript task object. One of the properties is for the Apply Label task. The other properties are all for pipette tasks.

Task properties

Properties available to all tasks

The following properties can be used for any task.

Property	Data type	Description
task.name	String	Name of the task, for example, "Aspirate"
task.description	String	Description of the task that is given under the icon in the protocol editor. For example, a downstack task that has the script `print(task.description)` will send the following text to the protocol log: Downstack from stacker2

Apply Label task

The JavaScript Apply Label task properties are listed below, along with the data type of the property and the names of the corresponding Apply Label task parameters.

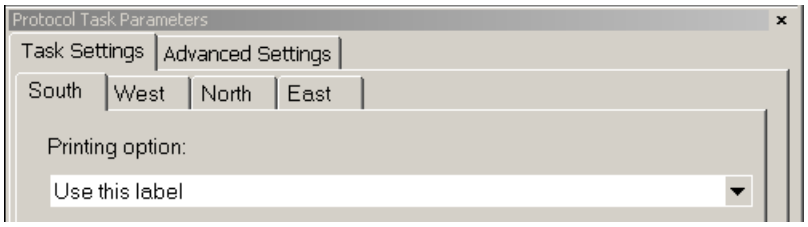
The task.side property is an array of four label_data objects:

- task.side[SOUTH]
- task.side[EAST]
- task.side[NORTH]
- task.side[WEST]

Each of these task.side properties has nine properties, representing the fields on the Protocol Task Parameters toolbar for the Apply Label task.

In the table below, *point* can be replaced by SOUTH, EAST, NORTH, or WEST. For example, the Printing option field for the south label (see screenshot) is represented as:

task.side[SOUTH].printLabel



Property	Data type	Task parameter(s)	Comments
task.side[*point*].field	An array of six strings	Field 1, Field 2, Field 3, Field 4, Field 5, Field 6	For example, task.side[WEST].field[2] matches the Field 2 text box in the West tab of the Protocol Task Parameters toolbar.
task.side[*point*].format	Integer	Format to use	A number that corresponds to the bar code format that you want. For information about formats, see the *VCode User Guide*.
task.side[*point*].incrementChars	Integer	Increment chars	The number of alphanumeric characters that you want to be appended to the root data.
task.side[*point*].startingIncrement	Integer	Starting increment #	The number that you want to be printed on the first label.
task.side[*point*].base	Integer	Numeric (0-9) Alphanumeric (0-Z)	0 for numeric increments 1 for alphanumeric increments
task.side[*point*].verifyBarcode	Integer	Verify bar codes	0 for no bar code verification 1 for bar code verification
task.side[*point*].maxVerifyAttempts	Integer	reapply up to __ times	The number of attempts made to verify a bar code.
task.side[*point*].sourceBarcodeSide	Integer	Use existing bar code from ____ side	Copies the bar code from this side of the plate 0 = South 1 = West 2 = North 3 = East
task.side[*point*].printLabel	Integer	Printing option	0 = No label 1 = Use this label 2 = South 3 = West 4 = North 5 = East

Aspirate task

The JavaScript Aspirate task properties are listed below, along with the data type of the property, the names of the corresponding aspirate properties in the Protocol Task Parameters toolbar, and a reference to more information.

Property	Data type	Task parameter	Comments
task.plateName	String	Plate name	The name of the plate. Read only.
task.acceleration	Float	Aspirate acceleration	The rate of increase in velocity before the maximum aspirate velocity is reached. If you selected a liquid class, this value is entered automatically from the liquid library editor.
task.liquidClass	String	Liquid class list box	The name of the liquid class.
task.postAspirateVolume	Float	Post aspirate volume	The volume of air to be drawn up after the liquid is drawn up.
task.preAspirateVolume	Float	Pre aspirate volume	The volume of air to be drawn up before the pipette tips enter the liquid.
task.quadrants	An array of pairs of integers	Quadrant selection diagram	A quadrant is an evenly spaced array of locations that is addressable by the tips on a pipette head. A 96-well head can dispense into a 96-well plate, four quadrants of a 384-well plate, and 16 quadrants of a 1536-well plate. A 384-well head can dispense into a 384-well plate or the four quadrants of a 1536-well plate.

Property	Data type	Task parameter	Comments
task.retract	Float	Tip retract distance	The distance that the tips should move downwards per unit volume of liquid being aspirated. This value allows the tips to move downwards during aspiration to maintain a certain height below the surface of the liquid. You will need to determine an appropriate value by trial-and-error for each type of plate you use. You might want this value to be the same as the Tip Retract Distance for the Dispense pipette task.
task.tipOffset (Distance from well bottom)	Float	Distance from well bottom	The distance between the bottom of the pipette tips and the bottoms of the plate wells or MicroWash tray chimneys. If you are using dynamic tip retraction this value sets the lowest point to which the tips will travel.
task.velocity	Float	Aspirate velocity	The rate at which to draw up liquid. If you selected a liquid class, this value is entered automatically from the liquid library editor.
task.volume	Float	Aspirate volume	The volume of liquid to be drawn up into each pipette tip.

Change Tips task

These properties are the same as the properties described for the Change Tips task.

Property	Data type	Task parameter	Comments
task.plateName	String	Plate name	The name of the plate.

Property	Data type	Task parameter	Comments
task.quadrants	An array of pairs of integers	Quadrants (diagram)	A quadrant is an evenly spaced array of locations that is addressable by the tips on a pipette head. A 96-well head can dispense into a 96-well plate, four quadrants of a 384-well plate, and 16 quadrants of a 1536-well plate.
task.action	Integer	❑ Press On New Tips (integer = 1) ❑ Tips off (integer = 2)	Puts tips on to a VPrep head or removes tips from a VPrep head.

Dispense task

These properties are the same as the properties described for the Dispense task.

Property	Data type	Task parameters	Comments
task.plateName	String	Plate name	The name of the plate.
task.acceleration	Float	Dispense acceleration	The rate of increase in velocity before the Dispense Velocity is reached. If you selected a liquid class, this value is entered automatically from the liquid library editor.
task.blowoutVolume	Float	Blowout volume	The volume of air to blow out when the tips are in the liquid. This is typically the same as the pre-aspirate volume.
task.liquidClass	String	Liquid class (list box)	The name of the liquid class.
task.postDispenseVolume	Float	Post dispense volume	The volume of air to blow out when the tips are out of the liquid.
task.quadrants	An array of pairs of integers	Quadrants (diagram)	A quadrant is an evenly spaced array of locations that is addressable by the tips on a pipette head. A 96-well head can dispense into a 96-well plate, four quadrants of a 384-well plate, and 16 quadrants of a 1536-well plate. A 384-well head can dispense into a 384-well plate or the four quadrants of a 1536-well plate.

Property	Data type	Task parameters	Comments
task.retract	Float	Retract distance	The distance that the tips should move upwards per unit volume of liquid being dispensed. This value allows the tips to move upwards during dispensing to maintain a certain height above the surface of the liquid. You will need to determine an appropriate value by trial-and-error for each type of plate you use. You might want this value to be the same as the Tip Retract Distance for the Aspirate pipette task.
task.tipOffset	Float	Distance from well bottom	The distance between the bottom of the pipette tips and the bottoms of the plate wells or MicroWash tray chimneys. If you are using dynamic tip retraction this value sets the lowest point to which the tips will travel.
task.tipTouch	Boolean	Enable tip touching	Whether you want the tips to touch the sides of the plate wells or not.
task.tipTouchHorizontalDistance	Float	Tip touch horizontal distance	When the value for this parameter is zero, the tips will move horizontally one well radius. The well radius is defined in the labware database for the type of plate you are using. If you want the tips to touch harder, increase this value. If you want the tips to touch more lightly, enter a negative value.
task.tiptouchRiseHeight	Float	Tip touch rise height	The height that the tips should move upwards before touching the side of the wells.
task.tipTouchSides	Integer	Number of sides to touch	The number of sides of the wells that you want the tips to touch.

Property	Data type	Task parameters	Comments
task.velocity	Float	Dispense velocity	The rate at which to dispense the liquid. If you selected a liquid class, this value is entered automatically from the liquid library editor.
task.volume	Float	Dispense volume	The volume of liquid to be moved out of each pipette tip.
task.enableShake	Boolean	Enable shaking	Turns on shelf shaking during dispense.
task.shakeRPM	Integer	Shake RPM	Shaking speed (in RPM).
task.shakeDelay	Integer	Post-dispense delay	Wait time (in milliseconds) before shaking starts.
task.shakeTime	Integer	Shake time	Duration (in milliseconds) of shaking.

Mix task

These properties are the same as the properties described for the Mix task.

Property	Data type	Task parameters	Comments
task.plateName	String	Plate name	The name of the plate.
task.aspirateAcceleration	Float	Aspirate acceleration	The rate of increase in velocity before the maximum aspirate velocity is reached. If you selected a liquid class, this value is entered automatically from the liquid library editor.
task.aspirateVelocity	Float	Aspirate velocity	The rate at which to draw up liquid. If you selected a liquid class, this value is entered automatically from the liquid library editor.
task.blowoff	Float	Last cycle blowout volume	The volume of air to blow out when the tips are in the liquid. This is typically the same as the pre-aspirate volume.
task.cycles	Integer	Number of mixing cycles	The number of aspirate/dispense operations.

Property	Data type	Task parameters	Comments
task.dispenseAcceleration	Float	Dispense acceleration	The rate of increase in velocity before the Dispense Velocity is reached. If you selected a liquid class, this value is entered automatically from the liquid library editor.
task.dispenseVelocity	Float	Dispense velocity	The rate at which to dispense the liquid. If you selected a liquid class, this value is entered automatically from the liquid library editor.
task.liquidClass	String	Liquid class (list box)	The name of the liquid class.
task.preAspirateAirGap	Float	Pre-aspirate volume	The volume of air to be drawn up before the pipette tips enter the liquid.
task.quadrants	An array of pairs of integers	Quadrants (diagram)	A quadrant is an evenly spaced array of locations that is addressable by the tips on a pipette head. A 96-well head can dispense into a 96-well plate, four quadrants of a 384-well plate, and 16 quadrants of a 1536-well plate. A 384-well head can dispense into a 384-well plate or the four quadrants of a 1536-well plate.
task.retract	Float	Retract distance	The distance that the tips should move upwards or downwards per unit volume of liquid being dispensed or aspirated. This value allows the tips to move upwards or downwards during dispensing or aspirating to maintain a certain height below or above the surface of the liquid. You will need to determine an appropriate value by trial-and-error for each type of plate you use.

Property	Data type	Task parameters	Comments
task.tipOffset	Float	Distance from well bottom	The distance between the bottom of the pipette tips and the bottoms of the plate wells or MicroWash tray chimneys. If you are using dynamic tip retraction this value sets the lowest point to which the tips will travel.
task.tipTouch	Boolean	Enable tip touching	Whether you want the tips to touch the sides of the plate wells or not.
task.tipTouchHorizontalDistance	Float	Tip touch horiz. dist	When the value for this parameter is zero, the tips will move horizontally one well radius. The well radius is defined in the labware database for the type of plate you are using. If you want the tips to touch harder, increase this value. If you want the tips to touch more lightly, enter a negative value.
task.tiptouchRiseHeight	Float	Tip touch rise height	The height that the tips should move upwards before touching the side of the wells.
task.tipTouchSides	Integer	Number of sides to touch	The number of sides of the wells that you want the tips to touch.
task.volume	Float	Mixing volume	The volume of liquid to be aspirated and dispensed to each plate well.

Loop task

These properties are the same as the properties described for the Loop task.

Property	Data type	Task parameter	Comments
task.numberOfLoops	Integer	Number of times to loop	Number of times to loop.

Pump Reagent task

These properties are the same as the properties described for the Pump Reagent task.

Property	Data type	Task parameter	Comments
task.action	Integer	❑ Fill reservoir (value = 0) ❑ Empty reservoir (value = 1)	The Fill reservoir and Empty reservoir values determine whether the pumps will fill or empty the reservoir. To empty the reservoir you must complete the Autofill Configuration information on the Shelves tab of the VPrep Diagnostics software. For more information, see the *VPrep User Guide*.
task.howOften	Integer	Every	The number that controls how frequently the liquid is pumped. For example, if you type `3`, the pump will run every third time the task runs.
task.maxLevel	Integer	Max level	The maximum percentage of liquid that you want the reservoir to contain.
task.minLevel	Integer	Min level	The minimum percentage of liquid that you want the reservoir to contain.
task.plateName	String	Plate name	The name of the plate.
task.shelf	String	(unnamed list box)	The shelf on which the reservoir is located.
task.speedPercent	Integer	at	The percentage of maximum pumping rate.
task.time	Integer	for	The time in seconds that the pumps pump.

Wash Tips task

These properties are the same as the properties described for the Wash Tips task.

Property	Data type	Task parameters	Comments
task.plateName	String	Plate name	The name of the plate.

Property	Data type	Task parameters	Comments
task.aspirateVelocity	Float	Aspirate velocity	The rate at which to draw up liquid. If you selected a liquid class, this value is entered automatically from the liquid library editor.
task.aspirateAcceleration	Float	Aspirate acceleration	The rate of increase in velocity before the maximum aspirate velocity is reached. If you selected a liquid class, this value is entered automatically from the liquid library editor.
task.blowoff	Float	Last cycle blowout volume	The volume of air to blow out when the tips are in the liquid. This is typically the same as the pre-aspirate volume.
task.cycles	Integer	Number of wash cycles	The number of aspirate/dispense operations.
task.dispenseAcceleration	Float	Dispense acceleration	The rate of increase in velocity before the Dispense Velocity is reached. If you selected a liquid class, this value is entered automatically from the liquid library editor.
task.dispenseToWaste	Boolean	Dispense to waste at height of (check box)	The tips will dispense outside the MicroWash tray chimneys.
task.dispenseVelocity	Float	Dispense velocity	The rate at which to dispense the liquid. If you selected a liquid class, this value is entered automatically from the liquid library editor.

Property	Data type	Task parameters	Comments
task.heightAboveWaste	Float	Dispense to waste at height of (text box)	The height, in millimeters, above the MicroWash chimneys at which the tips will dispense. Used in combination with the dispense to waste property. Enter a negative number to ensure that the tips are below the tops for the chimneys.
task.inFlowPercent	Integer	Inflow pump	The relative rate of liquid flow into the MicroWash tray manifold. This value should be high enough for the washing liquid to just bubble over the tops of the chimneys.
task.liquidClass	String	Liquid class (list box)	The name of the liquid class.
task.outFlowPercent	Integer	Outflow pump	The relative rate of liquid flow out of the MicroWash tray manifold. This value is typically zero because the fluid is drained by gravity.
task.preAspirateAirGap	Float	Pre-aspirate volume	The volume of air to be drawn up before the pipette tips enter the liquid.
task.quadrants	An array of pairs of integers	Quadrants (diagram)	A quadrant is an evenly spaced array of locations that is addressable by the tips on a pipette head. A 96-well head can dispense into a 96-well plate, four quadrants of a 384-well plate, and 16 quadrants of a 1536-well plate. A 384-well head can dispense into a 384-well plate or the four quadrants of a 1536-well plate.

Property	Data type	Task parameters	Comments
task.retract	Float	Retract distance	The distance that the tips should move upwards or downwards per unit volume of liquid being dispensed or aspirated. This value allows the tips to move upwards or downwards during dispensing or aspirating to maintain a certain height below or above the surface of the liquid. You will need to determine an appropriate value by trial-and-error for each type of plate you use.
task.tipOffset	Float	Distance from well bottom	The distance between the bottom of the pipette tips and the bottoms of the plate wells or MicroWash tray chimneys. If you are using dynamic tip retraction this value sets the lowest point to which the tips will travel.
task.tipTouch	Boolean	Enable tip touch	Whether you want the tips to touch the sides of the plate wells or not.
task.tipTouchHorizontalDistance	Float	Tip touch horiz. dist.	When the value for this parameter is zero, the tips will move horizontally one well radius. The well radius is defined in the labware database for the type of plate you are using. If you want the tips to touch harder, increase this value. If you want the tips to touch more lightly, enter a negative value.
task.tiptouchRiseHeight	Float	Tip touch rise height	The height that the tips should move upwards before touching the side of the wells.
task.volume	Float	Wash volume	The volume of liquid to be drawn up into each pipette tip.

Related information

For information about...	See...
Using JavaScript in VWorks	"Using JavaScript in VWorks" on page 269
The JavaScript plate object and properties	"Using JavaScript in VWorks" on page 269
Apply Label task parameters	"About setting Apply Label task parameters" on page 184
Change Tips task parameters	"Setting Change Tips pipette task parameters" on page 232
Dispense task parameters	"Setting Dispense pipette task parameters" on page 235
Dry Tips task parameters	"Setting Dry Tips pipette task parameters" on page 238
Loop pipette task parameters	"Setting Loop pipette task parameters" on page 248
Mix task parameters	"Setting Mix pipette task parameters" on page 249
Pump Reagent task parameters	"Setting Pump Reagent pipette task parameters" on page 252
Wash Tips task parameters	"Setting Wash Tips pipette task parameters" on page 262

Understanding the configuration settings in a pipette task

About this topic

Dozens of separate pieces of data are required by VWorks to complete a single pipetting task. These range from the velocity at which to aspirate a liquid to the height at which the gripper should approach a plate that is sitting on a platepad. These data are the configuration settings. With the right privileges, you can modify and add configuration settings to fine-tune and extend the capabilities of your VWorks.

How you can modify configuration settings is discussed in other topics. This topic uses the example of an Aspirate pipette task to provide the conceptual background you need to understand:

- ❑ The relationships between the device manager, labware editor, liquid library editor, task parameters, and protocol file
- ❑ What information is stored in a protocol
- ❑ Why you perform certain steps when creating protocols
- ❑ How to resolve protocol errors

Before reading this topic, it may help to read "Configuring a pipette process: example" on page 2.

This topic presents the same information from a different perspective.

Information flow diagram

The following diagram explains how information flows from the various data stores in VWorks into a single Aspirate pipette task that is stored as part of a protocol file.

Four main kinds of information are associated with a pipette task in a protocol file. These are:

- ❑ General task properties set in the Pipette Task Parameters toolbar
- ❑ Device information
- ❑ Labware information
- ❑ Liquid properties information

This information is included in the pipette task through a cascade of associations.

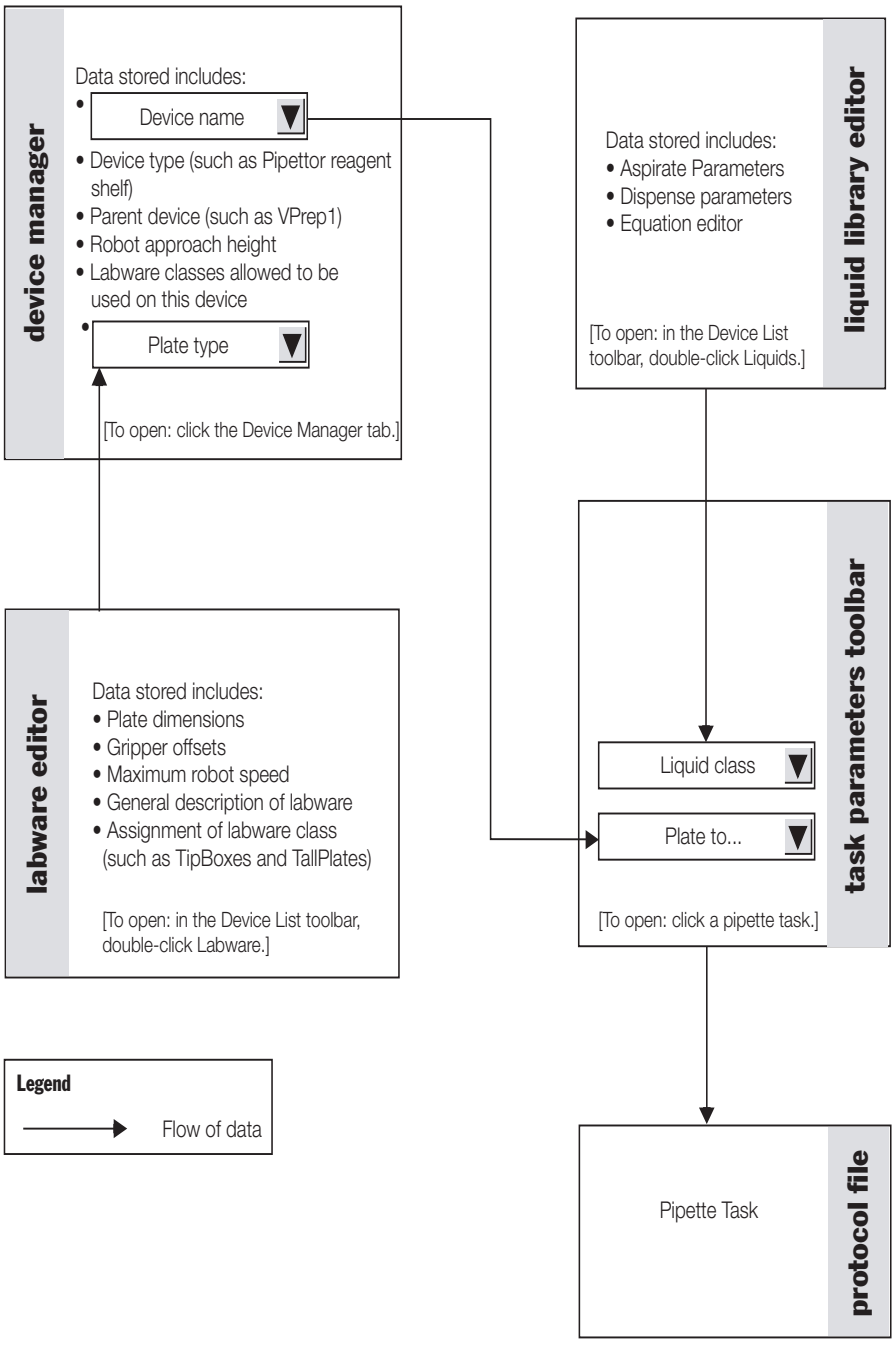
In the Aspirate pipette task example, the association between the type of liquid and the pipette task is made by selecting a liquid class for the pipette task.

All of the settings from the three data categories are stored in their respective databases and entered through their respective interface.

Data categories	Databases	Data interfaces
device files	device manager	device manager
plate types	labware database	labware editor

Data categories	Databases	Data interfaces
liquid classes	liquid library	liquid library editor

When a protocol is saved, the names of the three data categories that it uses are saved and associated with it, so that you don't have to select them every time. During a run, these data categories are referenced from the protocol they were associated with.


device manager
Data stored includes:
Device name
• Device type (such as Pipettor reagent shelf)
• Parent device (such as VPrep1)
• Robot approach height
• Labware classes allowed to be used on this device
Plate type
[To open: click the Device Manager tab.]
liquid library editor
Data stored includes:
• Aspirate Parameters
• Dispense parameters
• Equation editor
[To open: in the Device List toolbar, double-click Liquids.]
labware editor
Data stored includes:
• Plate dimensions
• Gripper offsets
• Maximum robot speed
• General description of labware
• Assignment of labware class (such as TipBoxes and TallPlates)
[To open: in the Device List toolbar, double-click Labware.]
task parameters toolbar
Liquid class
Plate to...
[To open: click a pipette task.]
Legend
Flow of data
protocol file
Pipette Task

About bar code reading and tracking

About this topic

This topic gives an overview of the bar code reading and tracking that can be set up through VWorks.

Who should read this

Technicians and administrators who write protocols with bar code reader tasks or VCode tasks.

Bar code readers

A customized lab automation system can have bar code readers installed that can read bar codes on one side of a plate (the side varies, depending on your application needs). These may be installed on VPrep shelves or platepads. Every time a plate is moved to one of these devices the bar code is read.

Note: To read a bar code at a platepad bar code reader or VCode, use the Place Plate task.

VCode: bar code printer and optional reader

If your lab automation system has a VCode, you have the ability to print and apply bar code labels.

If the VCode includes an optional reader, bar code labels can be read on any side of the plate, because the VCode can rotate the plate in a full circle.

Related information

For information about...	See...
Reading bar codes on plates (at a platepad)	"Setting Place Plate task parameters" on page 204
Planning to add bar code labels to plates	"Using bar code input files" on page 293
Applying bar code labels	"Setting Apply Label task parameters" on page 185

Using bar code input files

About this topic

This topic describes how to create and use bar code input files.

Who should read this

Technicians and administrators who write protocols with bar code reader or Apply Label (VCode) tasks.

Bar code fields

When setting up a VCode, you set task parameters that specify the content of bar code fields.

An example of a bar code field is:

NAW1001

Bar code fields can be imported from bar code input files.

For detailed information about bar code fields and formats, see the *VCode User Guide*.

Bar code input files

Filename and location

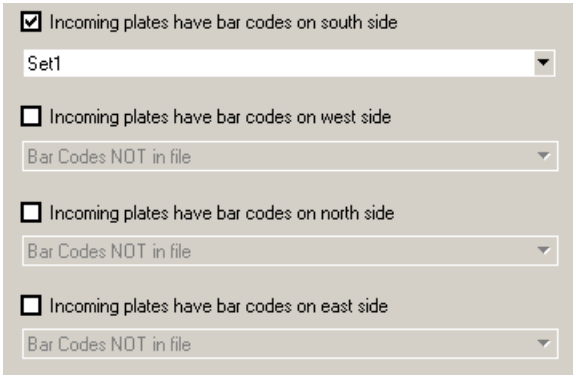
Bar code input files are text files with the naming convention (*filename*.bar). They are stored in the location specified in the general VWorks options.

When to use

You can use bar code input files to do the following:

- ❑ Verify the bar codes on incoming plates, which are plates that are downstacked into the system.

  This function is set in the parameters for the plate icon of the incoming plates:


Incoming plates have bar codes on south side
Set1
Incoming plates have bar codes on west side
Bar Codes NOT in file
Incoming plates have bar codes on north side
Bar Codes NOT in file
Incoming plates have bar codes on east side
Bar Codes NOT in file

- ❑ Specify each field of a bar code that is printed on a plate.

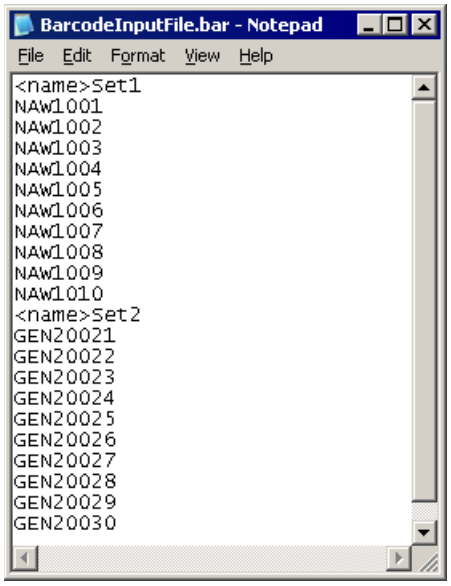
How they are created

Bar code input files are typically generated by a LIMS system, although you can create them manually.

File structure

Bar code input files contain lists of bar code fields, or parts of fields, that are grouped together in series. In the following example, there are two series:

- Set1
- Set2



Each series could be used to label a different side of the same plate or label plates during different runs.

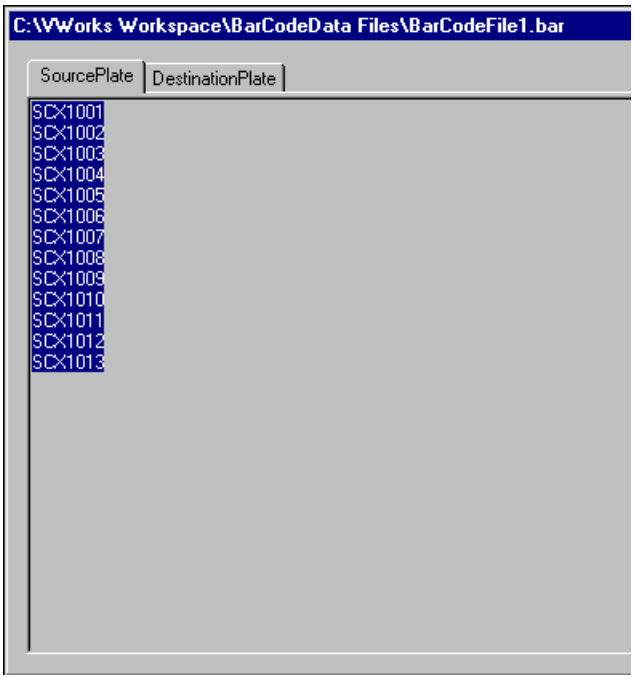
Viewing a bar code file in VWorks

You can view the bar code file that is currently associated with VWorks as follows.

To view the associated bar code input file:

1. Select **Tools** > **Show Bar Code File**.

   This opens a view of the bar code data file.



2. Click a tab to show a different series of data.
3. To close the window, click the close box.

Updating a bar code input file

If you change a bar code input file while a protocol is running, you must reload the file for the change to be registered.

To reload a bar code input file:

1. Select **Tools** > **Reload Bar Code File**.

   The bar code input file is reloaded.

Related information

For information about...	See...
Input text files	"Setting general options" on page 34
Bar code reading and printing (general information)	"About bar code reading and tracking" on page 292
Bar code data files	"Using bar code data files" on page 296

Using bar code data files

About this topic

This topic describes how to create and use bar code data files in collaboration with bar code input files.

Who should read this

Technicians and administrators who write protocols with Apply Label (VCode) tasks.

Bar code data files

File format and location

Bar code data files are tab-delimited text files with the name *filename*.dat. They are stored in a location specified in the general VWorks options.

How they work

A bar code data file acts as a lookup table that specifies what bar code fields to print on other sides of a plate. The typical sequence of events is as follows:

1. A plate with a south-side bar code is downstacked into the system.
2. The robot picks up the plate, reads the bar code, and verifies it against a bar code input file.
3. The robot moves the plate to a VCode.
4. The bar code that was read is used as a key to look up the bar code fields to print on the other sides of the plate, using the bar code data file as the lookup table.
5. The VCode prints a bar code on the north-side, east-side, and west-side of the plate.

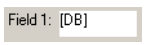
Bar code data files can also be used with incoming plates that have west-side bar codes. In this case, the bar code must be read at the VCode or platepad and not by the robot's bar code reader.

!! IMPORTANT !! Bar code data files cannot currently be used with incoming bar codes on the north or east sides.

Bar code data files can still be used if the downstacked plate has no bar code, provided that incoming bar code verification is turned off. The plate could be moved to the VCode and labelled on its south or west side. That label could then be read and used with a bar code data file to specify the labels to be printed on the other sides of the plate.

Where they are specified

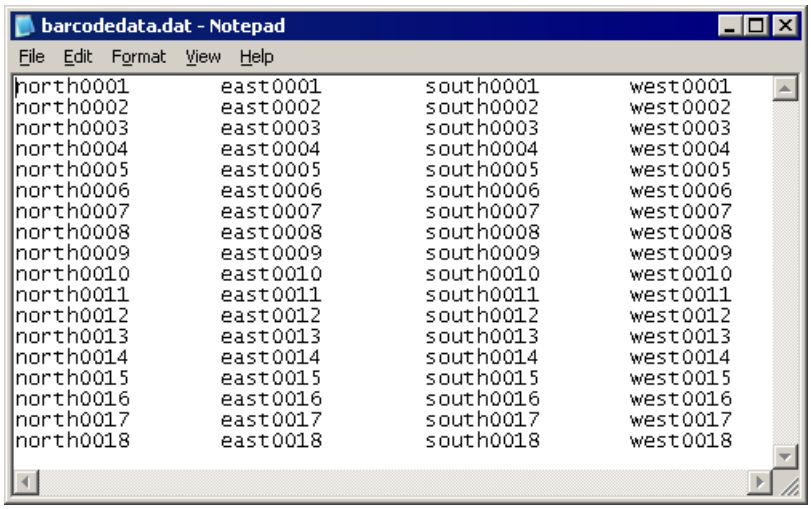
The use of bar code data files is specified when configuring task parameters for an Apply Label task.



File structure

An example of a bar code data file is shown below. The columns are separated by tabs.

!! IMPORTANT !! The columns must be in the order north, east, south and west, from left to right.


barcodedata.dat - Notepad
File Edit Format View Help
north0001 east0001 south0001 west0001
north0002 east0002 south0002 west0002
north0003 east0003 south0003 west0003
north0004 east0004 south0004 west0004
north0005 east0005 south0005 west0005
north0006 east0006 south0006 west0006
north0007 east0007 south0007 west0007
north0008 east0008 south0008 west0008
north0009 east0009 south0009 west0009
north0010 east0010 south0010 west0010
north0011 east0011 south0011 west0011
north0012 east0012 south0012 west0012
north0013 east0013 south0013 west0013
north0014 east0014 south0014 west0014
north0015 east0015 south0015 west0015
north0016 east0016 south0016 west0016
north0017 east0017 south0017 west0017
north0018 east0018 south0018 west0018

Related information

For more information about...	See...
Bar code data files	“Setting general options” on page 34
Bar code input files	“Using bar code input files” on page 293
Applying bar codes	“Setting Apply Label task parameters” on page 185

About the FileReader plug-in

About this topic

Velocity11 has created a plug-in for VWorks called FileReader.dll. This topic describes the plug-in.

The FileReader plug-in lets VWorks read from a tab-delimited or a CSV (comma separated values) file to specify the content of label fields printed with a VCode.

Who should read this

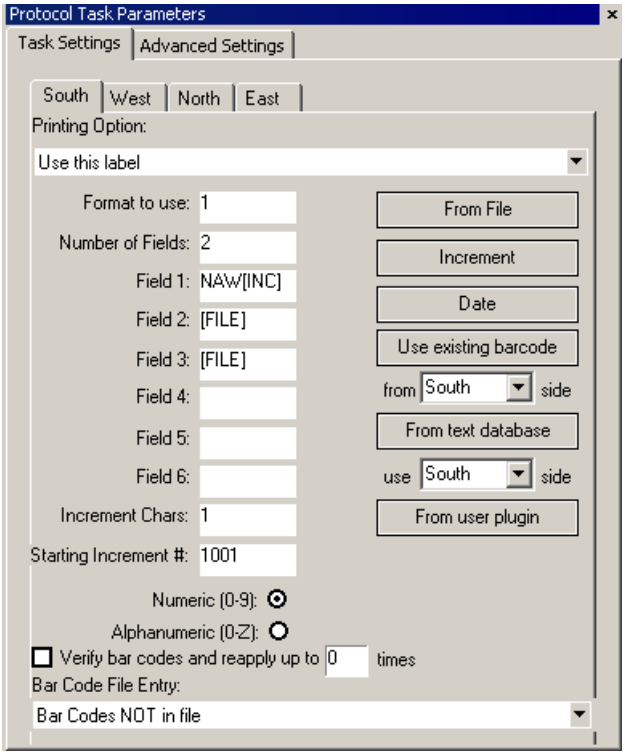
Technicians and administrators who write protocols with Apply Label (VCode) tasks and who want the FileReader plug-in to read and process the label text.

Defining label field content

The Apply Label task provides several ways to define the contents of the label fields printed on a series of plates during a run. However, without plug-ins and scripting, for each label in a given run, the Apply Label task *cannot* apply:

- ❑ Two different pieces of data from the same file
- ❑ Two different increments for two fields
- ❑ Numeric increments for one field and alphanumeric increments for another different field

In the following screenshot, Field2 and Field3 use the same label input file for the data in the fields. However, this function is limited because there is no way to specify two different locations in the same file for the same label.



The FileReader plug-in allows VWorks to input the data in the label fields from a text file. Functionally, the text file is similar to a label data file except that it includes data for all fields in a label instead of just one field. This allows two fields on the same label to contain different data from the same file in the same run, without using prefixes and suffixes.

Related information

For information about...	See...
Using bar code input files	"Using bar code input files" on page 293
The Apply Label task	"About setting Apply Label task parameters" on page 184
Setting up the FileReader plug-in	"Using the FileReader plug-in in a protocol" on page 301

About the FileReader file format

About this topic

This topic describes the format of the text file that is read by the FileReader plug-in.

Who should read this

Technicians and administrators who write protocols with Apply Label (VCode) tasks and who want to use the FileReader plug-in to read and process the label text.

The header row

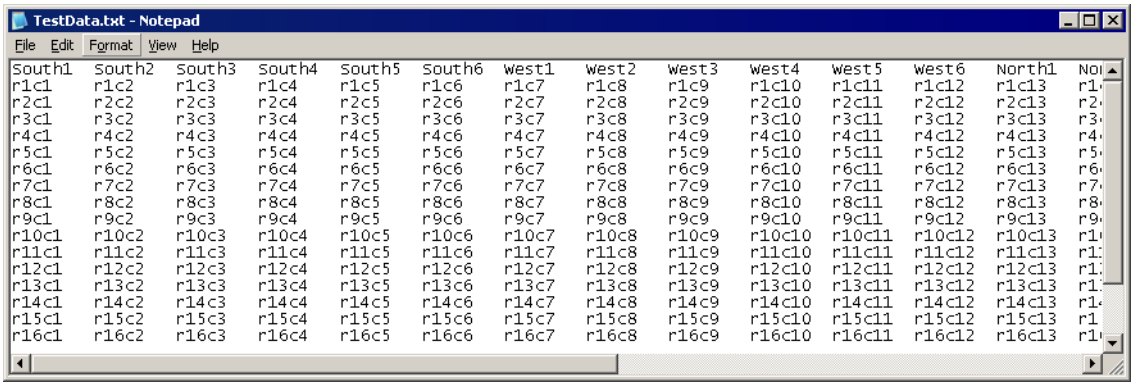
The first row in the text file must contain a header row.

The header row is a human-readable guide to show where the contents of each column will print.

The FileReader plug-in will assume that the rest of the text contains the same text separation method as the header row.

For example, if the header row uses a CSV format but the rest of the file uses a tab-delimited format, the FileReader plug-in expects commas to separate the values in the file. Having found none, it assumes that the entire text for each row after the header row is one field.

A screenshot of a FileReader plug-in text file is shown below. This example is a tab-delimited text file, but a CSV text file could also be used.



South1	South2	South3	South4	South5	South6	West1	West2	West3	West4	West5	West6	North1	Nor
r1c1	r1c2	r1c3	r1c4	r1c5	r1c6	r1c7	r1c8	r1c9	r1c10	r1c11	r1c12	r1c13	r1
r2c1	r2c2	r2c3	r2c4	r2c5	r2c6	r2c7	r2c8	r2c9	r2c10	r2c11	r2c12	r2c13	r2
r3c1	r3c2	r3c3	r3c4	r3c5	r3c6	r3c7	r3c8	r3c9	r3c10	r3c11	r3c12	r3c13	r3
r4c1	r4c2	r4c3	r4c4	r4c5	r4c6	r4c7	r4c8	r4c9	r4c10	r4c11	r4c12	r4c13	r4
r5c1	r5c2	r5c3	r5c4	r5c5	r5c6	r5c7	r5c8	r5c9	r5c10	r5c11	r5c12	r5c13	r5
r6c1	r6c2	r6c3	r6c4	r6c5	r6c6	r6c7	r6c8	r6c9	r6c10	r6c11	r6c12	r6c13	r6
r7c1	r7c2	r7c3	r7c4	r7c5	r7c6	r7c7	r7c8	r7c9	r7c10	r7c11	r7c12	r7c13	r7
r8c1	r8c2	r8c3	r8c4	r8c5	r8c6	r8c7	r8c8	r8c9	r8c10	r8c11	r8c12	r8c13	r8
r9c1	r9c2	r9c3	r9c4	r9c5	r9c6	r9c7	r9c8	r9c9	r9c10	r9c11	r9c12	r9c13	r9
r10c1	r10c2	r10c3	r10c4	r10c5	r10c6	r10c7	r10c8	r10c9	r10c10	r10c11	r10c12	r10c13	r1
r11c1	r11c2	r11c3	r11c4	r11c5	r11c6	r11c7	r11c8	r11c9	r11c10	r11c11	r11c12	r11c13	r1
r12c1	r12c2	r12c3	r12c4	r12c5	r12c6	r12c7	r12c8	r12c9	r12c10	r12c11	r12c12	r12c13	r1
r13c1	r13c2	r13c3	r13c4	r13c5	r13c6	r13c7	r13c8	r13c9	r13c10	r13c11	r13c12	r13c13	r1
r14c1	r14c2	r14c3	r14c4	r14c5	r14c6	r14c7	r14c8	r14c9	r14c10	r14c11	r14c12	r14c13	r1
r15c1	r15c2	r15c3	r15c4	r15c5	r15c6	r15c7	r15c8	r15c9	r15c10	r15c11	r15c12	r15c13	r1
r16c1	r16c2	r16c3	r16c4	r16c5	r16c6	r16c7	r16c8	r16c9	r16c10	r16c11	r16c12	r16c13	r1

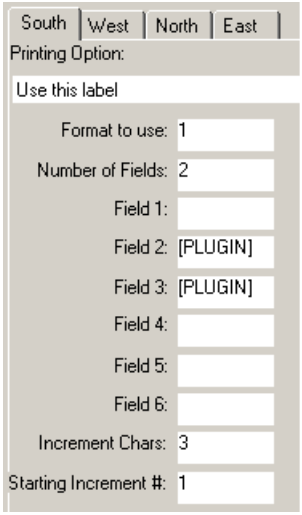
The order of the columns

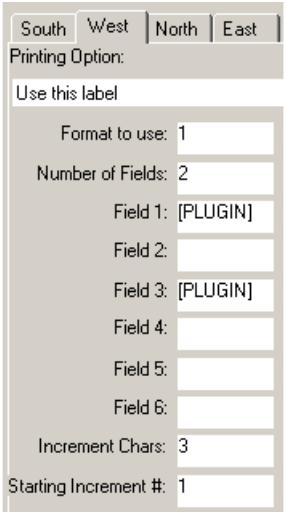
Note how the order of the columns references the order of the tabs in the Apply label task Protocol Task Parameters toolbar.

The six columns of a particular side correspond to the six fields in the protocol task parameters.

The column “South3” is the column that contains the root data that will be printed on the south side of the plate in field 3. Each row of the table represents a different cycle in the run. The first row contains the root data that will be printed during the first run cycle, and so on.

The following screenshots show how the same plug-in is used in a total of four fields, on two sides of the plate.





Using these parameters, data from the above plug-in file would print the following labels:

Field	Printed labels in run cycle 1
South, Field 2	r1c2
South, Field 3	r1c3
West, Field 1	r1c7
West, Field 3	r1c9

Repeating columns

A text file with data for labels on only one side of the plate is sufficient to print the same labels on other sides of the plate.

To understand this, think of the columns as occurring in six column sets. If there are fewer than six columns, the remaining columns will be left blank.

If there is only one set in the file, the set is repeated for the other sides of the plate where you have selected "Use this label" from the list box.

Related information

For information about...	See...
The FileReader plug-in	"About the FileReader plug-in" on page 298
How to set up the FileReader plug-in	"Using the FileReader plug-in in a protocol" on page 301

Using the FileReader plug-in in a protocol

About this topic

The FileReader plug-in is installed and registered during the standard VWorks installation. You should see the FileReader.dll file in your VWorks Workspace\bin\plugins folder.

This topic describes how to modify the task parameters in the protocol so that the Apply Label task uses the FileReader plug-in.

Who should read this

Technicians and administrators who write protocols with Apply Label (VCode) tasks and who want the FileReader plug-in to read and process the label text.

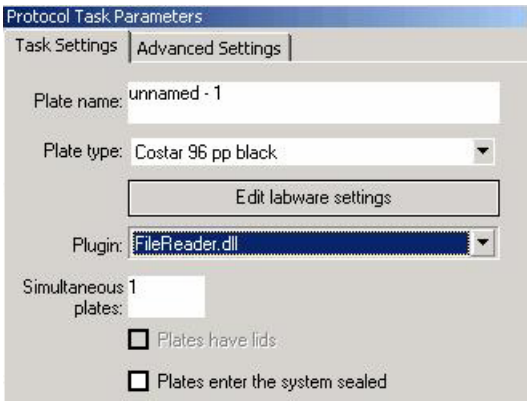
Setting up the protocol

Create a protocol, and then modify the plate icon and Apply Label task parameters as described here.

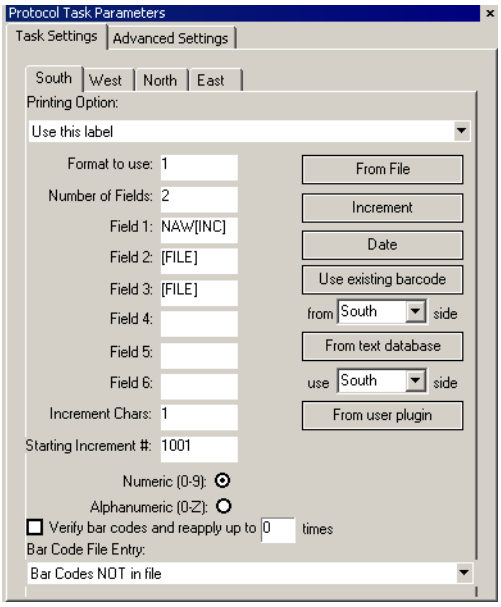
To set up the protocol to use the File Reader plug-in:

1. Select a plug-in to use:
   a. Click the plate icon in the **Protocol Editor**.
   b. Select FileReader.dll from the **Plugin** list box of the **Protocol Task Parameters** group box.

      If the FileReader.dll is not available for selection, it is because the FileReader.dll file is missing from the plug-ins folder.

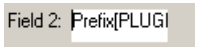


2. Populate the **Apply label** task fields:
   a. Click the **Apply label** icon in the **Protocol Editor**.
   b. Populate the **Apply label** task fields with the **From user plugin** button.



   c. If you would like to use prefixes or suffixes, enter them before or after **[PLUGIN]** in the relevant **Field** text box.

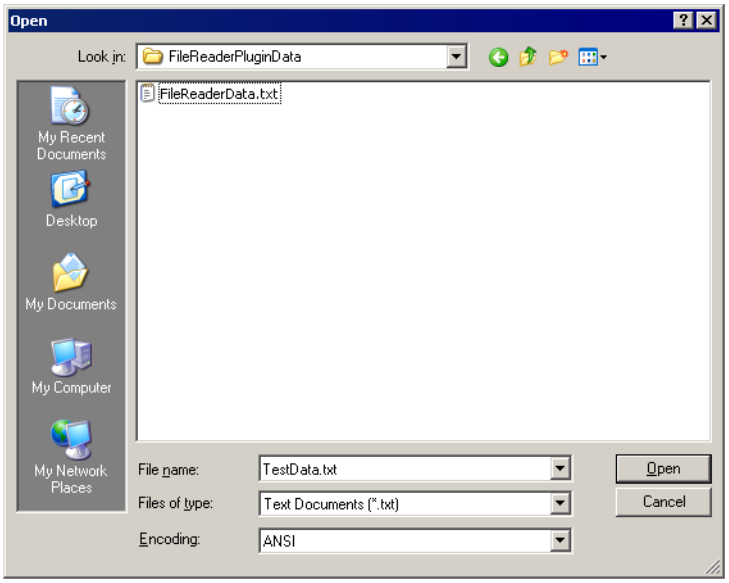
      An example field with a prefix is shown in the following screenshot.



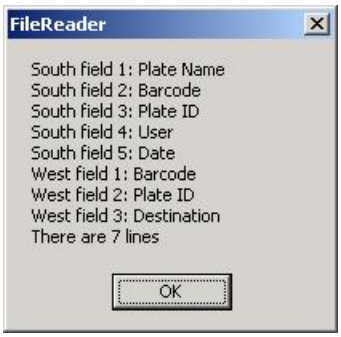
Running the protocol

To run a protocol with a FileReader plugin file:

1. Open the protocol that you created to use the FileReader plugin.
2. Click **Start** from VWorks to start the protocol.
3. Select the plug-in text file from the dialog box that opens.

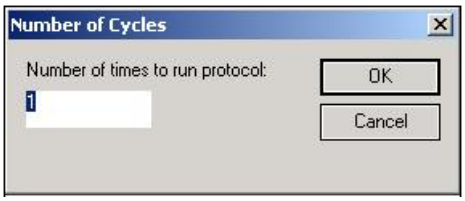


4. In the **FileReader** dialog box that opens, check the list of names of the columns of the text file and the total number of rows in the file.



5. Click **OK**.

   The **Number of Cycles** dialog box opens.



6. Enter the number of cycles to run.

   If the file is not the one you intend to use, you can cancel the run.

   If the number of rows in the file is greater than the number of cycles that are run, the extra rows will be unused.

   If the number of rows is less than the number of cycles that are run, an error occurs when the rows are executed. If the error is ignored, additional labels are left blank.

   The input file does not change during a run, so if you perform another run with the same file, the same labels will print.

   If a power outage occurs during a run, and you are unable to resume the run, delete the first few rows after the header row. Then run the protocol again.

7. Click **OK**.

Related information

For information about...	See...
The FileReader plug-in	"About the FileReader plug-in" on page 298
Creating protocols and the protocol editor	"Creating a protocol: basics" on page 161

12 Using the VWorks inventory

This chapter describes how to use the inventory to track plates that move in and out of long-term plate storage devices.

VWorks inventory overview

About this topic

This topic provides the background information you need to understand how to use the inventory manager to track groups of plates moving into and out of a plate storage device.

Who should read this

Read this topic if your lab automation system has a Liconic StoreX, Heraeus Cytomat PLC, or a Velocity11 PlateHub and you are using, or want to set up, inventory management with a database.

Before you start

Before starting to create protocols that use a StoreX also read:

- ❑ The StoreX information in the *Device Driver User Guide*
- ❑ "Resolving plate inventory problems" on page 524

Before starting to create protocols that use a PlateHub also read:

- ❑ The PlateHub information in the *BioCel User Guide*
- ❑ "Resolving plate inventory problems" on page 524

Bar code tracking versus inventory management

Bar code tracking

Plates are often tracked using south-side bar codes. With south-side bar code tracking, every time the robot picks up a plate, the bar code is read and compared with the plate that is expected to be at that position. This accurately tracks plates through a protocol, but it is limited because the plate locations are stored in memory and are lost when you exit VWorks.

Inventory management

The inventory management system allows long-term tracking of plates as bar code data is permanently stored in a database. This is useful for lab automation systems with devices that store plates for a long time, such as a Velocity11 PlateHub, Heraeus Cytomat PLC, and Liconic StoreX.

Required database

To use inventory management you must have a SQL database set up, either on the computer that runs VWorks or a computer that is on the same local area network.

How plates are stored

The long-term storage devices supported by VWorks store plates in cassettes and slots. A cassette is a vertical rack of plates that has many slots, with each holding one plate.

Information that is stored

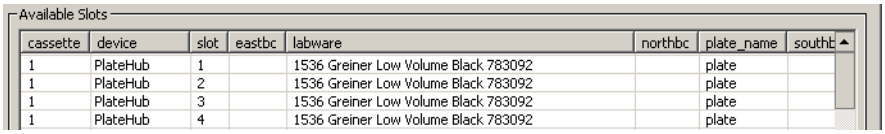
The inventory maintains a list of plates in every long-term plate storage device.

The information contained about each plate in the inventory includes the:

- ❑ Cassette and slot location of the plate
- ❑ Name of the group or location to which it belongs
- ❑ Labware type
- ❑ Any north-side, south- side, east-side, and west-side bar codes.

  West side bar codes are tracked only if an optional bar code reader is used.

The list of plates in the inventory is displayed in the Inventory Plate Group Editor Preview dialog box. An example view is shown below.


Available Slots
cassette
device
slot
eastbc
labware
northbc
plate_name
1 PlateHub 1 1536 Greiner Low Volume Black 783092 plate
1 PlateHub 2 1536 Greiner Low Volume Black 783092 plate
1 PlateHub 3 1536 Greiner Low Volume Black 783092 plate
1 PlateHub 4 1536 Greiner Low Volume Black 783092 plate

The list of plates in the inventory is updated every time a plate is moved with a robot in to or out of a storage device so that at all times, the list is current.

Inventory manager

The Inventory Editor dialog box is where you manage the inventory. From here you can:

- ❑ Create groups
- ❑ Create locations
- ❑ Review information about plates in a group or location
- ❑ Import groups from a bar code file
- ❑ Change the plate type associated with plates in the database
- ❑ Delete plates from the database
- ❑ Inventory the plates in a plate storage device

Plate groups and Location groups

With long-term storage devices, typically only a sub-set of the plates stored in the device is used in one protocol. You can set up two different types of plate sub-sets, called plate groups and location groups. Which you choose for a particular protocol depends on what you are planning to do.

Inventory management tasks

The following tasks are used with the inventory management system. These are the tasks that move plates in to and out of a long-term storage device:

- ❑ Load
- ❑ Unload
- ❑ Incubate at plate storage device

About manually moving plates

Keeping the database synchronized

It is important to note that the database cannot track plates that you manually add, remove, or move. To keep the database synchronized with the long-term storage device, load and unload the plate storage device robotically, or periodically reinventory the storage device.

Instead of manually adding plates to the storage device, write a protocol to downstack the plates and load them. Instead of manually removing plates from the storage device, write a protocol to unload the plates and upstack them.

If you must manually load and unload plates

If you must manually load and unload plates you will need to create a protocol to load or unload the exact plates that you are manually adding or removing and then run the simulator.

With an appropriate protocol, the simulated run accurately changes the plates listed in the database without actually moving any plates.

Terminology

When describing the movement of plates, it is important to use terms correctly. The terms *load* and *unload* are used from the storage device's perspective.

Term	Definition
Unload	The act of moving a plate from a storage device into the system.
Load	The act of moving a plate from the system into a storage device.
System	Plates that are being processed by the current protocol are considered to be in the system. For example: ❑ A plate on a platepad is in the system. ❑ A plate in a plate hotel is in the system. ❑ A plate being incubated in an incubator is in the system. ❑ A plate half-way up a VStack rack is not in the system, unless it will be moved during the current protocol. ❑ A plate being stored in a PlateHub is not in the system unless it will be moved during the current protocol.

Database backup

The inventory management database can be backed up onto another computer using a software utility. If you want to do this, contact the Velocity11 Service Center for more information.

Related information

For information about...	See...
Inventory groups, plate groups and location groups	"About inventory groups" on page 311
Setting up the database	"Setting up the inventory management database" on page 309
Moving plates in and out of a storage device	❑ "Moving plates into a storage device" on page 318 ❑ "Moving stored plates out of the system" on page 321 ❑ "Moving plates between storage devices" on page 324
Incubating plates	"Using a plate group to incubate plates" on page 326
Using bar code input files	"Creating a plate group with a bar code input file" on page 329

Setting up the inventory management database

Who should read this

Read this topic if your lab automation system has a Liconic StoreX, Heraeus Cytomat PLC, or Velocity11 PlateHub and you are using, or want to set up, inventory management with a database.

About setting up the database

To set up the inventory management database, contact Velocity11 for assistance.

Setting the database connection

The database connection is specified in VWorks.

To set the database connection:

1. Navigate to **Tools** > **Options**.
2. Click the **Log Options** tab.
3. In the Database connection string text box, type `dsn=velocity11`.
4. Click **Test & Save** to test the connection.

Related information

For information about...	See...
Inventory groups, plate groups and location groups	"About inventory groups" on page 311
Moving plates in and out of a storage device	❑ "Moving plates into a storage device" on page 318 ❑ "Moving stored plates out of the system" on page 321 ❑ "Moving plates between storage devices" on page 324
Incubating plates	"Using a plate group to incubate plates" on page 326
Using bar code input files	"Creating a plate group with a bar code input file" on page 329

Opening the inventory editor

About this topic

This topic describes how to open and close the inventory editor.

Who should read this

Read this topic if your lab automation system has a Liconic StoreX, Heraeus Cytomat PLC, or a Velocity11 PlateHub and you are using inventory management with a database.

Before you start

Before you can open the inventory editor, the inventory database that the editor communicates with must be set up. See "Setting up the inventory management database" on page 309 for more information.

Opening the inventory editor

To open the inventory editor:

1. Select **Tools** > **Inventory Editor**

You can also open it by selecting a **Load** or **Unload** task in a protocol and clicking **Edit location groups** or **Edit plate groups**.

Closing the inventory editor

To close the inventory editor:

1. Click the close box in the top right corner.

About inventory groups

About this topic

This topic explains what inventory groups are and how to choose which type of plate group to use.

Who should read this

Read this topic if your lab automation system has a Liconic StoreX incubator, Heraeus Cytomat PLC, or Velocity11 PlateHub.

Before you start

Before reading this topic, read "VWorks inventory overview" on page 306.

Inventory groups defined

An inventory group is a group of plates that is a subset of the plates listed in the plate inventory.

Types of inventory group

There are two types of inventory groups:

- ❑ Location group
- ❑ Plate group

Location groups

Location groups are used to move plates from a specific location in the storage device.

Example:

In this example, a location group that contains the plates in cassette 1, slots 1–10 is created.

When an Unload task uses this location plate group, the robot moves whatever plates are in cassette 1, slots 1–10, regardless of the identity of the plates, out of the storage device and in to the system.

When a Load task uses a location group, it moves the plates that are in the system into to cassette 1, slots 1–10 of the storage device, regardless of the identity of the plates.

When to use

Location plate groups are used:

- ❑ When the storage device is being filled or emptied.
- ❑ When groups of plates are removed from the lab automation system and replaced with other groups of plates on a regular basis. This would be done by replacing a cassette of plates with a new one.

Plate groups

Plate groups are used to move specific plates to or from the storage device, but without regard for the location. Plate groups can be used when operators do not routinely remove and replace whole cassettes of plates.

When a plate is first moved into the system by VWorks, such as when it is downstacked, it is assigned an identifier in the database. After that VWorks tracks where that plate is at all times. This tracking does not require the plates to have bar code labels, VWorks just "knows" what it does with every plate during a protocol and so is able to track where each plate goes.

Plate groups make use of this tracking system.

Note: You cannot use a plate group with a Load task—you have to specify a location group. You can, though, associate a plate group with the location group so that the plates that are loaded are immediately given a plate group.

Example:

A plate group in a plate storage device contains the following plates:

- ❑ Plate 26
- ❑ Plate 31
- ❑ Plate 41
- ❑ Plate 107

These plates are scattered around storage device, not in adjacent slots of the same cassette. When the Unload task uses this plate group, it moves these plates out of the storage device into the system.

When to use

Plate groups are typically used in compound management systems where plates are housed in the storage device almost permanently.

For each protocol, a different plate group is unloaded, run and then loaded back to a storage device.

Group membership

A single plate can be a member of more than one plate or location group.

Related information

For information about...	See...
Creating a location group	"Creating a location group" on page 313
Creating a plate group	"Creating a plate group" on page 316
Moving plates in and out of a storage device	❑ "Moving plates into a storage device" on page 318 ❑ "Moving stored plates out of the system" on page 321 ❑ "Moving plates between storage devices" on page 324
Incubating plates	"Using a plate group to incubate plates" on page 326
Using bar code input files	"Creating a plate group with a bar code input file" on page 329

Creating a location group

About this topic

This topic describes how to create a location group, which is a list of plates that can be moved to or out of particular slots in a plate storage device.

Who should read this

Read this topic if your lab automation system has a Liconic StoreX incubator, Heraeus Cytomat PLC, or Velocity11 PlateHub.

Before you start

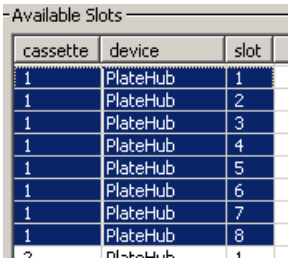
Before reading this topic, read "VWorks inventory overview" on page 306.

Procedure

To create a location group:

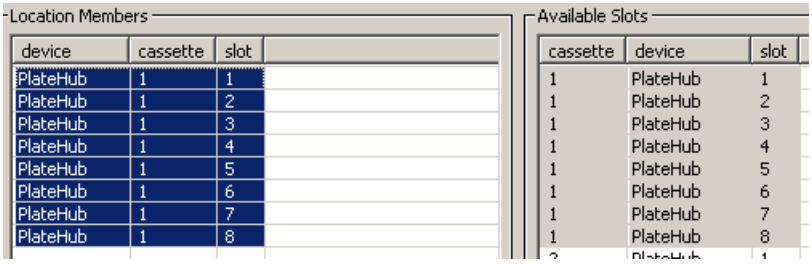
1. Add a **Load** task to a protocol and select it.
2. In the **Protocol Task Parameters** toolbar, select the **Locations** tab.
3. Click **Edit location groups** to open the inventory editor.
4. Click **Create new** and enter a name for the group.

5. Click **OK**.
6. Select a group of available slots.



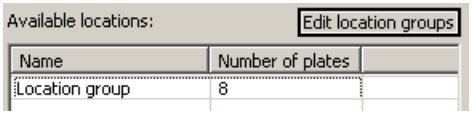
You can use CTRL + click or SHIFT + click to select more than one slot.

7. Drag the group into the **Location Members** list.



8. Click **Save Changes**.
9. Click the close box to close the inventory editor.

The location group is listed in the **Available locations** list of the **Load Protocol Task Parameters** toolbar.



Deleting a location group

To delete a location group from the inventory:

1. Open the inventory editor.
2. Select a location group in the **Saved Location**s group box.
3. Click **Delete**.

Related information

For information about...	See...
Creating a plate group	"Creating a plate group" on page 316
Opening the inventory editor	"Opening the inventory editor" on page 310
Moving plates in and out of a storage device	❑ "Moving plates into a storage device" on page 318 ❑ "Moving stored plates out of the system" on page 321 ❑ "Moving plates between storage devices" on page 324
Incubating plates	"Using a plate group to incubate plates" on page 326
Using bar code input files	"Creating a plate group with a bar code input file" on page 329

Creating a plate group

About this topic

This topic describes how to create a plate group, which is a list of specific plates that can be moved to or out of a plate storage device without regard for in which slots they are stored.

Who should read this

Read this topic if your lab automation system has a Liconic StoreX incubator, Heraeus Cytomat PLC, or Velocity11 PlateHub.

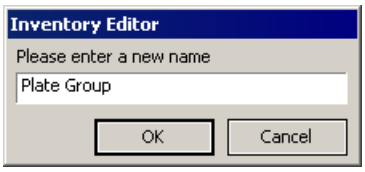
Before you start

Before reading this topic, read "VWorks inventory overview" on page 306.

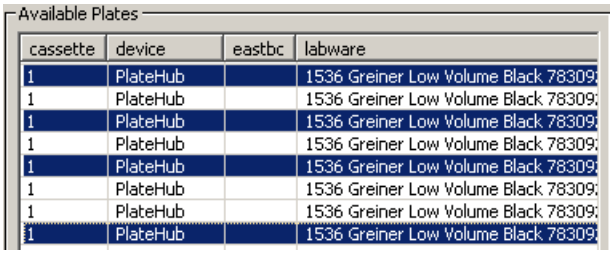
Procedure

To create a plate group:

1. Add a **Load** task to a protocol and select it.
2. In the **Protocol Task Parameters** toolbar, select the **Groups** tab.
3. Click **Edit plate groups** to open the inventory editor.
4. Click **Create new** and enter a name for the group.



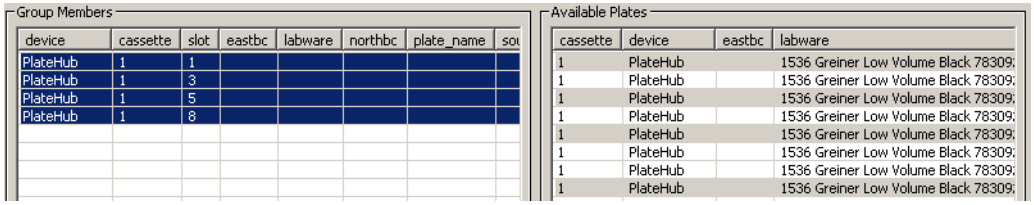
5. Click **OK**.
6. Select a group of available plates.


Available Plates
cassette
device
eastbc
labware
1 PlateHub 1536 Greiner Low Volume Black 78309
1 PlateHub 1536 Greiner Low Volume Black 78309
1 PlateHub 1536 Greiner Low Volume Black 78309
1 PlateHub 1536 Greiner Low Volume Black 78309
1 PlateHub 1536 Greiner Low Volume Black 78309
1 PlateHub 1536 Greiner Low Volume Black 78309
1 PlateHub 1536 Greiner Low Volume Black 78309
1 PlateHub 1536 Greiner Low Volume Black 78309

   If there are no available plates, you must first move plates into the storage device.

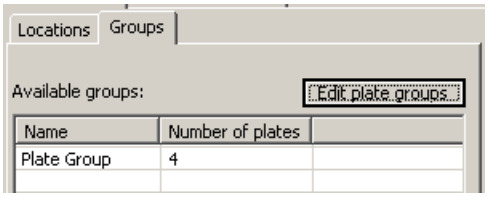
   You can use CTRL + click or SHIFT + click to select more than one slot.

7. Drag the group into the **Group Members** list.



8. Click **Save Changes**.
9. Click the close box to close the inventory editor.

   The plate group is listed in the **Available locations** list of the **Load Protocol Task Parameters** toolbar.

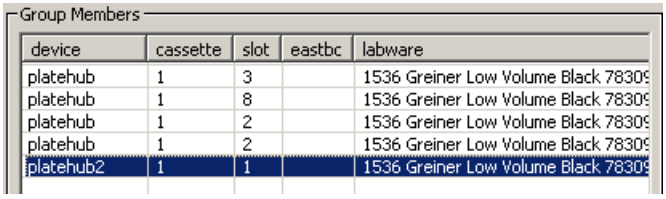


Changing the processing order

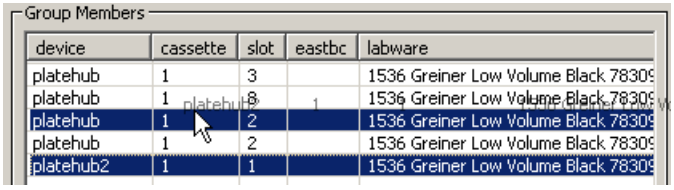
You can change the order in which the plates in a plate group will be processed.

To change the processing order:

1. In the plate group list, select a plate.


Group Members
device
cassette
slot
eastbc
labware
platehub 1 3 1536 Greiner Low Volume Black 78309
platehub 1 8 1536 Greiner Low Volume Black 78309
platehub 1 2 1536 Greiner Low Volume Black 78309
platehub 1 2 1536 Greiner Low Volume Black 78309
platehub2 1 1 1536 Greiner Low Volume Black 78309

2. Drag it to a higher position in the list.


Group Members
device
cassette
slot
eastbc
labware
platehub 1 3 1536 Greiner Low Volume Black 78309
platehub 1 8 1536 Greiner Low Volume Black 78309
platehub 1 2 1536 Greiner Low Volume Black 78309
platehub 1 2 1536 Greiner Low Volume Black 78309
platehub2 1 1 1536 Greiner Low Volume Black 78309

Deleting a plate group

To delete a plate group from the inventory:

1. Open the inventory editor.
2. Select the plate group in the **Saved Groups** group box.
3. Click **Delete**.

Related information

For information about...	See...
Creating a location group	"Creating a location group" on page 313
Opening the inventory editor	"Opening the inventory editor" on page 310
Moving plates in and out of a storage device	❑ "Moving plates into a storage device" on page 318 ❑ "Moving stored plates out of the system" on page 321 ❑ "Moving plates between storage devices" on page 324
Incubating plates	"Using a plate group to incubate plates" on page 326
Using bar code input files	"Creating a plate group with a bar code input file" on page 329

Moving plates into a storage device

About this topic

This topic describes how to add plates into the system for storage in a plate storage device. You would do this when first filling the device. Adding plates into the system means more than just loading them into a storage device. It means adding the plate identifications into the record that VWorks keeps of plates in the system.

Who should read this

Read this topic if your lab automation system has a Liconic StoreX incubator, Heraeus Cytomat PLC, or Velocity11 PlateHub.

Before you start

Before reading this topic, read "VWorks inventory overview" on page 306.

Ways to fill a storage device

There are two ways to fill an empty storage device with plates.

❑ Robotically

❑ Manually

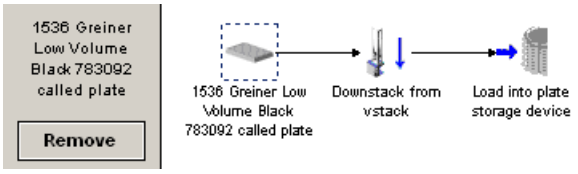
Loading plates robotically

To load plates robotically, the plates are placed in a stacker, downstacked and moved to the storage device.

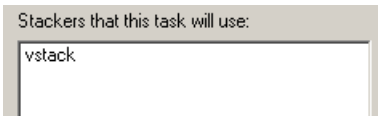
To load plates robotically:

1. Make sure that a robot device has been added and configured in the device manager.
2. Make sure that the plate storage device has been correctly configured in the device manager.

   All slots must be accessible to the robot and must use labware of a class that is allowed.
3. Make sure that if you have made changes to the device file it has been saved.
4. If you are using the simulator to "virtually" load plates, make sure that the **Enable plate tracking in simulation mode** check box is selected in the **Log Options** dialog box.
5. Create a protocol like the one in the following screenshot:

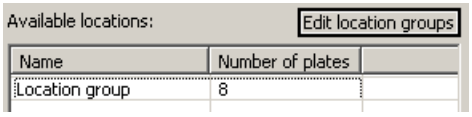

1536 Greiner Low Volume Black 783092 called plate
Remove
1536 Greiner Low Volume Black 783092 called plate
Downstack from vstack
Load into plate storage device

6. Make sure that the **Downstack** task is configured to use the stacker.

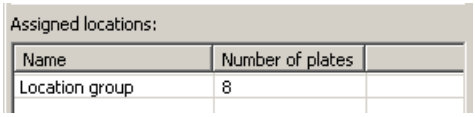


7. Create a location group.

   Make sure that the location group is listed in the **Available locations** list of the **Load Protocol Task Parameters** toolbar.

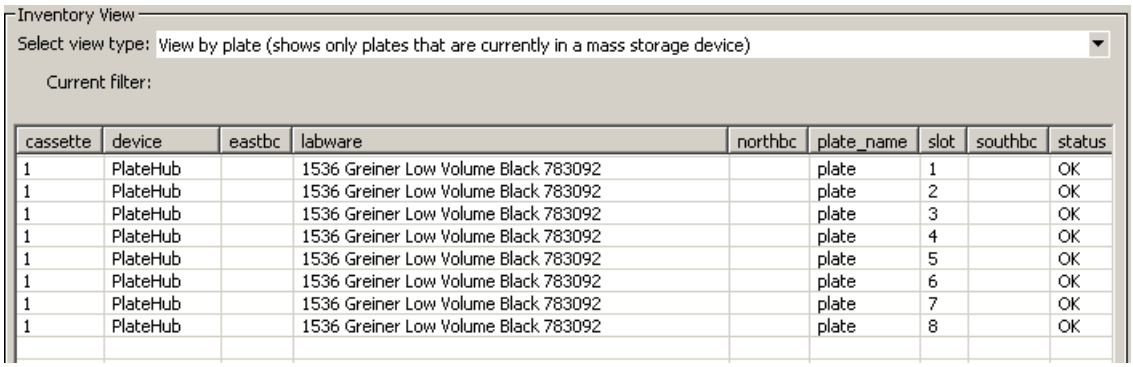


8. Drag the group into the **Assigned locations** list.



9. Click **Start** and resolve any error messages.
10. In the **Number of Cycles** dialog box, enter a number that equals the number of plates you want to load into the storage device.
11. Click **OK**.

12. Confirm that the plates are in the inventory:
    a. Click the **Load** task.
    b. Click **Edit location groups** to open the inventory editor.
    c. Click the **Inventory Management** tab.


Inventory View

Select view type: View by plate (shows only plates that are currently in a mass storage device)

Current filter:

cassette	device	eastbc	labware	northbc	plate_name	slot	southbc	status
1	PlateHub		1536 Greiner Low Volume Black 783092		plate	1		OK
1	PlateHub		1536 Greiner Low Volume Black 783092		plate	2		OK
1	PlateHub		1536 Greiner Low Volume Black 783092		plate	3		OK
1	PlateHub		1536 Greiner Low Volume Black 783092		plate	4		OK
1	PlateHub		1536 Greiner Low Volume Black 783092		plate	5		OK
1	PlateHub		1536 Greiner Low Volume Black 783092		plate	6		OK
1	PlateHub		1536 Greiner Low Volume Black 783092		plate	7		OK
1	PlateHub		1536 Greiner Low Volume Black 783092		plate	8		OK

Loading plates manually

To load plates manually, cassettes of plates are physically put in to the storage device and a run is simulated to create the matching list of plates in the inventory.

To load plates manually:

1. Physically load the cassettes of plates in to the storage device.
2. Follow the procedure for loading plates robotically, but click **Simulation is off** to turn on the simulator.

   Make sure that the location group matches the cassettes that you loaded.
3. Click **Start** to run the simulator.
4. Review the inventory editor to make sure that the plates listed in the inventory match the plates actually in the device.
5. Click **Simulation is on** to turn off the simulator.

Related information

For information about...	See...
Moving plates out of a storage device	“Moving stored plates out of the system” on page 321
Moving plates between storage devices	“Moving plates between storage devices” on page 324

Moving stored plates out of the system

About this topic

This topic describes how to remove plates that are in a storage device from the system. Removing plates from the system is more than just unloading them from the storage device. It means removing the plates from the lab automation system as well as removing the plate identifications from the record of the plates in the system that VWorks keeps.

Who should read this

Read this topic if your lab automation system has a Liconic StoreX incubator, Heraeus Cytomat PLC, or Velocity11 PlateHub.

Before you start

Before reading this topic, read “VWorks inventory overview” on page 306.

Ways to remove plates

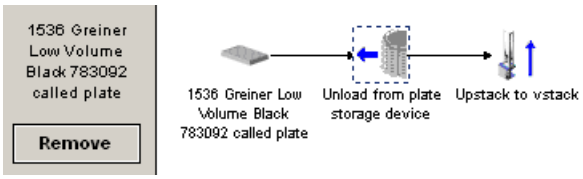
There are two ways to remove plates from a plate storage device.

- ❑ Robotically
- ❑ Manually

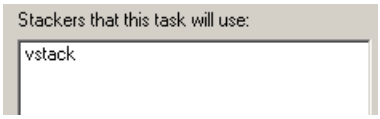
Removing plates robotically

To move plates from a storage device robotically:

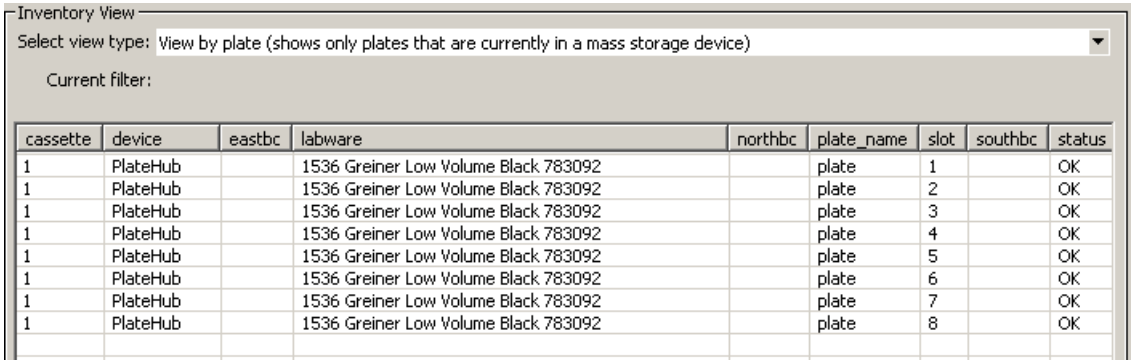
1. Create a protocol like the one shown in the following screenshot:


1536 Greiner Low Volume Black 783092 called plate
Remove
1536 Greiner Low Volume Black 783092 called plate
Unload from plate storage device
Upstack to vstack

2. Make sure that the **Upstack** task is configured to use the stacker.

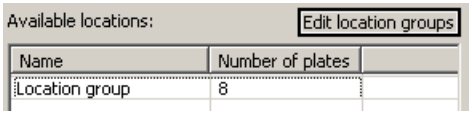


3. In the inventory editor, identify the plates that you want to move:
   a. Click the **Unload** task.
   b. Click **Edit location groups** to open the inventory editor.
   c. Click the **Inventory Management** tab.

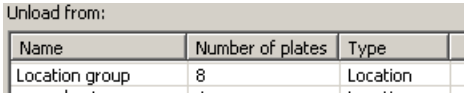

Inventory View
Select view type: View by plate (shows only plates that are currently in a mass storage device)
Current filter:

cassette	device	eastbc	labware	northbc	plate_name	slot	southbc	status
1	PlateHub		1536 Greiner Low Volume Black 783092		plate	1		OK
1	PlateHub		1536 Greiner Low Volume Black 783092		plate	2		OK
1	PlateHub		1536 Greiner Low Volume Black 783092		plate	3		OK
1	PlateHub		1536 Greiner Low Volume Black 783092		plate	4		OK
1	PlateHub		1536 Greiner Low Volume Black 783092		plate	5		OK
1	PlateHub		1536 Greiner Low Volume Black 783092		plate	6		OK
1	PlateHub		1536 Greiner Low Volume Black 783092		plate	7		OK
1	PlateHub		1536 Greiner Low Volume Black 783092		plate	8		OK

4. Create a location group in the inventory editor, saving the changes and confirming it by making sure that it is listed in the **Available locations** list of the **Load Protocol Task Parameters** toolbar.



5. Drag the group into the **Unload from list**.



6. Click **Start**.
7. In the **Number of Cycles** dialog box, enter a number that equals the number of plates you want to remove from the storage device.
8. Click **OK**.
9. Confirm that the plates are no longer in the inventory:
   a. Click the **Load** task.
   b. Click **Edit location groups** to open the inventory editor.
   c. Click the **Inventory Management** tab.

Emptying a storage device manually

To empty a storage device manually, cassettes of plates are physically removed from the storage device and a run is simulated to remove the matching list of plates from the inventory.

To remove plates manually:

1. Physically remove the cassettes of plates from the storage device.
2. Follow step 1 to step 5 in the procedure above for emptying a storage device robotically.
3. Make sure that the **Enable plate tracking in simulation mode** check box is selected.
4. Click **Simulation is off** to turn on the simulator.
5. Click **Start**.
6. In the **Number of Cycles** dialog box, enter a number that equals the number of plates you want to remove from the storage device.
7. Click **OK**.
8. Confirm that the plates are no longer in the inventory:
   a. Click the **Load** task.
   b. Click **Edit location groups** to open the inventory editor.
   c. Click the **Inventory Management** tab.

Note: You can also remove the plates and delete the relevant rows from the inventory editor.

Related information

For information about...	See...
Creating a location group	"Creating a location group" on page 313
Creating a plate group	"Creating a plate group" on page 316
Moving plates in and out of a storage device	❑ "Moving plates into a storage device" on page 318 ❑ "Moving plates between storage devices" on page 324
Incubating plates	"Using a plate group to incubate plates" on page 326
Using bar code input files	"Creating a plate group with a bar code input file" on page 329

Moving plates between storage devices

About this topic

This topic provides an example to illustrate how you can move a group of plates out of one plate storage device and put them into another. The general procedure could also be used to move a group of plates within a single storage device.

Who should read this

Read this topic if your lab automation system has a Liconic StoreX incubator, Heraeus Cytomat PLC, or Velocity11 PlateHub.

Before you start

Before reading this topic, read "VWorks inventory overview" on page 306.

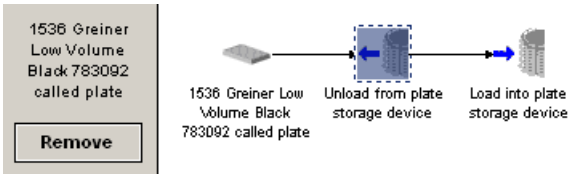
Make sure that both plate storage devices are properly configured in the device manager.

Moving a plate

In this example procedure, a group of four plates is moved from one plate storage device (PlateHub) to another (PlateHub2).

To move a plate:

1. Create a process that has a **Load** and an **Unload** task, as shown in the following example.


1536 Greiner Low Volume Black 783092 called plate
Remove
1536 Greiner Low Volume Black 783092 called plate
Unload from plate storage device
Load into plate storage device

2. Select either the **Load** or **Unload** task and click **Edit location groups**.

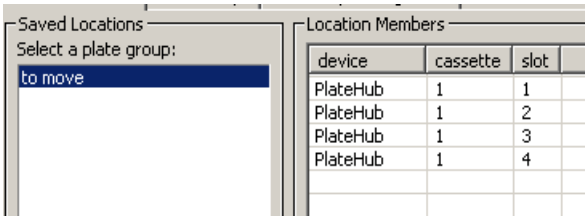
   The inventory editor opens.

3. Click the **Inventory Management** tab and note the device, cassette, and slot locations of the plates that you want to move.

   In this example, the plates will be moved from PlateHub, cassette 1, slots 5–8.

4. Click the **Location Groups** tab and create a location group for these plates.

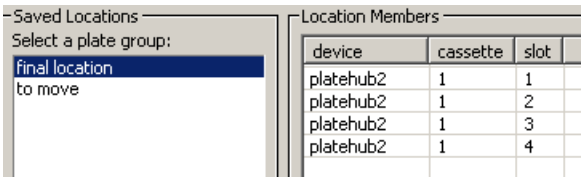
   Note: The plates do not need to be in adjacent slots for them to be in a location group.



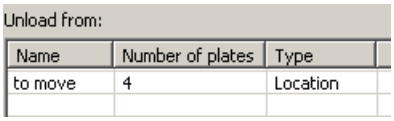
5. Return to the **Inventory Management** tab and note the device, cassette and slot numbers for the slots that you want to move the plates to.

   In this example, the plates will be moved to PlateHub2, cassette 1, slots 1–4.

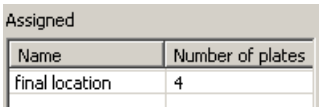
6. Click the **Location Groups** tab and create a location group for these slots.



7. Click **Save changes** and close the inventory editor.
8. Select the **Unload** task and in the **Protocol Task Parameters** toolbar drag the location group in the first device to the **Unload from** list.



9. Select the **Load** task and in the **Protocol Task Parameters** toolbar drag the location group in the second device to the **Assigned locations** list.



10. Compile the protocol and check for errors.

11. Click **Start** to start the run.
12. In the **Number of Cycles** dialog box, type in the number of plates that you are moving and click **OK**.
13. Open the inventory editor and click the **Inventory Management** tab to make sure that the plates moved as expected.

Related information

For information about...	See...
Creating a location group	"Creating a location group" on page 313
Creating a plate group	"Creating a plate group" on page 316
Opening the inventory editor	"Opening the inventory editor" on page 310
Moving plates in and out of a storage device	❑ "Moving plates into a storage device" on page 318 ❑ "Moving stored plates out of the system" on page 321
Incubating plates	"Using a plate group to incubate plates" on page 326
Using bar code input files	"Creating a plate group with a bar code input file" on page 329

Using a plate group to incubate plates

About this topic

This topic shows an example protocol where a plate group is moved out of a PlateHub into a StoreX incubator at 42 degrees Celcius, and then returned to the PlateHub.

Location groups versus plate groups

Location groups are used for:

- ❑ Groups of plates that are moved into the system and then to particular slots in a storage device
- ❑ Groups of plates in particular slots in a storage device that are moved out of the system

Several topics in this section describe how location groups are used.

Some applications require that plates are stored in the storage device for a long time but where exactly the plates are stored is not important. With these applications operators do not routinely remove and replace whole cassettes of plates so the plates do not need to be stored in particular cassettes. As long as the identities of the plates are tracked, they can be stored anywhere. Plate groups can be used for these applications.

Who should read this

Read this topic if your lab automation system has a Liconic StoreX incubator, Heraeus Cytomat PLC, Velocity11 PlateHub.

Before you start

Before reading this topic, read:

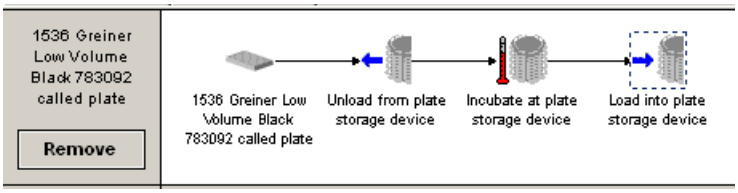
- ❑ "VWorks inventory overview" on page 306
- ❑ "Creating a plate group" on page 316

Procedure

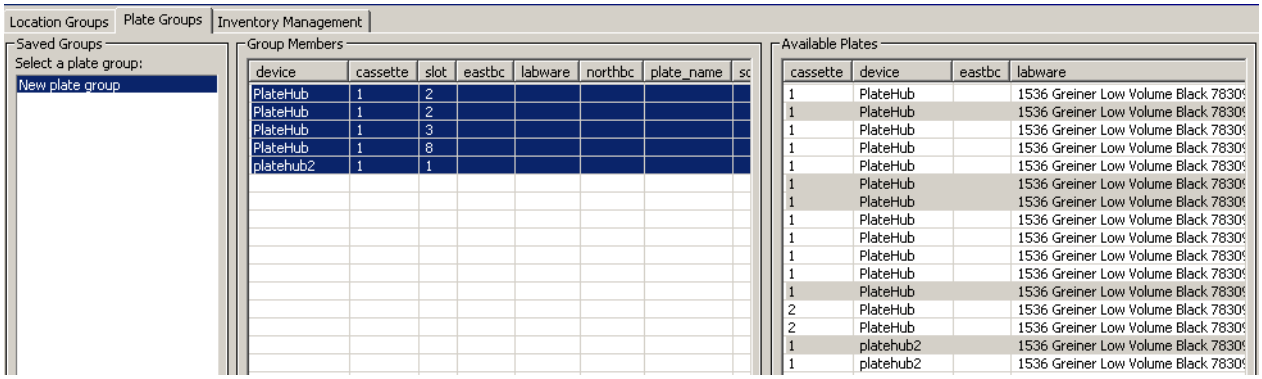
This procedure assumes that there are already plates in the PlateHub.

To incubate a plate group:

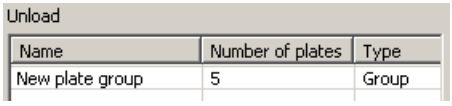
1. Create a protocol like the one shown below.


1536 Greiner Low Volume Black 783092 called plate
Remove
1536 Greiner Low Volume Black 783092 called plate
Unload from plate storage device
Incubate at plate storage device
Load into plate storage device

2. Create a new plate group in the inventory editor and save the changes.

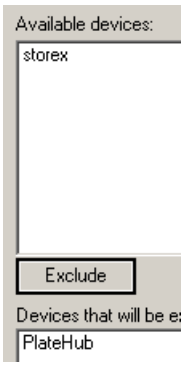

Location Groups
Plate Groups
Inventory Management
Saved Groups
Select a plate group:
New plate group
Group Members
device cassette slot eastbc labware northbc plate_name
PlateHub 1 2
PlateHub 1 2
PlateHub 1 3
PlateHub 1 8
platehub2 1 1
Available Plates
cassette device eastbc labware
1 PlateHub 1536 Greiner Low Volume Black 7830
2 PlateHub 1536 Greiner Low Volume Black 7830
1 platehub2 1536 Greiner Low Volume Black 7830
1 platehub2 1536 Greiner Low Volume Black 7830

3. Select the **Unload** task and in the **Protocol Task Parameters** toolbar, drag the plate group to the **Unload** list.



4. Select the **Incubate** task and exclude any devices that you do not want to be used for the incubation task.

   In this example, the plates should not be incubated on a PlateHub that is available.



5. Select the **Load** task and in the **Protocol Task Parameters** toolbar, drag the plate group to the **Unload** list.

6. Run the protocol.

Related information

For information about...	See...
Creating a plate group	"Creating a plate group" on page 316
Moving plates in and out of a storage device	❑ "Moving plates into a storage device" on page 318 ❑ "Moving stored plates out of the system" on page 321 ❑ "Moving plates between storage devices" on page 324
Using bar code input files	"Creating a plate group with a bar code input file" on page 329
Starting a run	"Starting a run from VWorks" on page 61.

Creating a plate group with a bar code input file

About this topic

This topic describes how to use a bar code input file to create a plate group. This is the most efficient way to create plate group if you previously used a bar code input file to label a collection of plates. which are now stored in a plate storage device.

Who should read this

Read this topic if your lab automation system has a Liconic StoreX incubator, Heraeus Cytomat PLC, or Velocity11 PlateHub.

Before you start

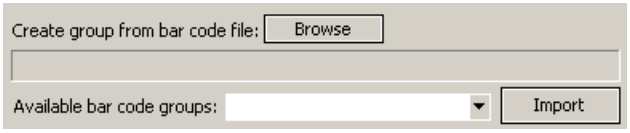
Before reading this topic, read "VWorks inventory overview" on page 306.

Procedure

!! IMPORTANT !! All plates with bar codes listed in the selected bar code input file series must already be in the storage device.

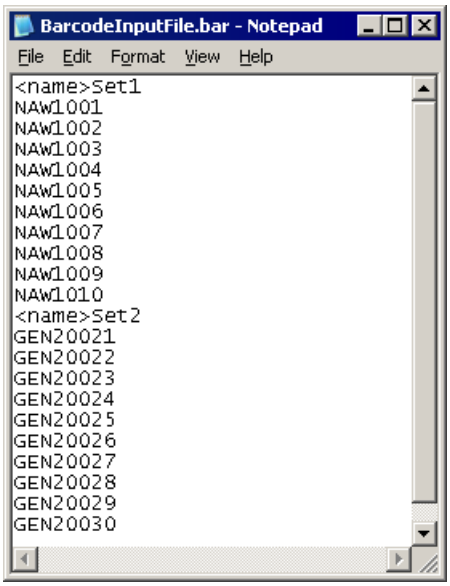
To create a plate group with a bar code input file:

1. Open the inventory editor.
2. Click the **Groups** tab.
3. Click the **Browse** button and navigate to the .bar file that you want to use.



4. From the **Available Bar code groups** list box, select the group that you want to use.

   In the following example of a bar code input file, the options would be Set1 and Set2.



5. Click **Import**.

   The plates labelled with west-side bar codes listed in the series will be used to create a group and will appear in the **Plates currently in the selected group** list.

6. Specify a labware type for each plate using the labware selection function in the **Inventory Management** tab.

Related information

For information about...	See...
Opening the inventory editor	“Opening the inventory editor” on page 310
Using the labware selection list	“Reinventorying the plate inventory” on page 333

Inventory editor views and filters

About this topic

This topic describes how to make the inventory editor easier to work with by showing only the items in the inventory editor that are relevant at the particular time.

Who should read this

Read this topic if your lab automation system has a Liconic StoreX incubator, Heraeus Cytomat PLC, or Velocity11 PlateHub.

Before you start

Before reading this topic, read "VWorks inventory overview" on page 306.

Inventory editor views

There are three ways to view the plates in the inventory editor.

To set the view:

1. Open the inventory editor.
2. Click to select the **Inventory Management** tab.
3. From the **Select view type** list, select one of the following options:

View	Description
View by plate	Displays every plate in the inventory. This is the most frequently used view.
View by location	Displays both plates and slots.
View unassigned plates	Displays plates that were orphaned during previous runs. This means plates that are on the system but not in a plate storage device. Unassigned plates do not appear in linker groups so cannot be used.

Filtering displayed plates

You may have many plates stored in the database. To simplify your view of the database, you can filter the records that are displayed.

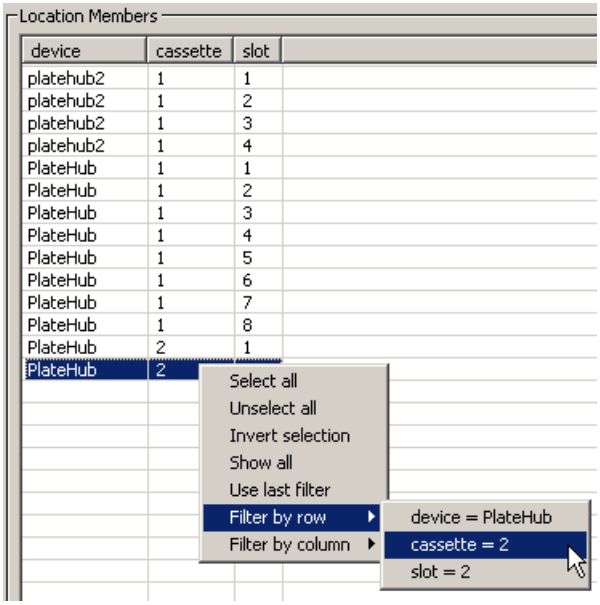
To filter the plate records:

1. Right-click on a list in any of the tabbed pages of the inventory editor and select **Show all**.
2. Right-click on a particular cell and select from the available filtering options.

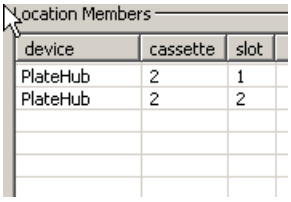
View	Description
Use last filter	Returns the display of items to that displayed when the last filter was applied
Filter by row	The items that have the same value as the selected item in the row are displayed

View	Description
Filter by column	The items that have the same value as the selected item in the column are displayed

The items that have the same value as the selected item in the row are displayed.



The result is that only those plates in cassette number 2 are listed.



To show all plate records:

1. Right-click on the database list and select **Show all**.

Related information

For information about...	See...
Opening the inventory editor	"Opening the inventory editor" on page 310

Reinventorying the plate inventory

About this topic

This topic describes how to use the reinventory feature of plate inventory.

This feature can be used to check for mismatches by comparing the identities of the plates actually in a plate storage device with the plates that the inventory database says should be in the plate storage device.

Mismatches can arise, for example, if you physically load plates into the storage device and then use the simulator to virtually "move the plates" into the database. In this case there will be no labware associated with the plates.

The reinventory feature can also be used to enter bar code information for plates that have been manually placed into the storage device.

Who should read this

Read this topic if your lab automation system has a plate storage device that includes an optional bar code reader.

Before you start

Before reading this topic, read "VWorks inventory overview" on page 306.

About performing an inventory

The accuracy of the inventory database can be checked by performing a new inventory of the database. You can perform an inventory of the entire storage device or part of it.

The device's bar code reader checks all selected slots for the presence of a bar code and reads those that it finds. The results are checked against the inventory database.

!! IMPORTANT !! For reinventorying to be successful, each plate must have a unique bar code.

Reinventorying logic

If a plate is found in a slot that, according to the inventory database, should not have a plate, a line is added to the inventory editor for that slot and the plate's bar code is recorded. If that bar code is already associated with another slot in the database, the previous association is deleted. In doing this, the system assumes that the plate has been manually moved.

If the inventory has a line for a plate in a particular slot, but the inventory finds no plate in that slot, the line is removed from the inventory. However, the data in the system that is associated with the plate is not deleted. If in the future, if the plate is returned to the system, when the next inventory is performed the data can be reassociated with it.

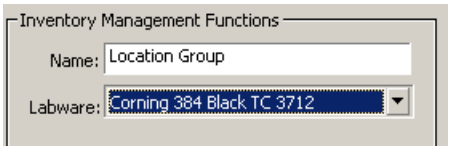
Procedure

To reinventory the plate storage device:

1. Open the inventory editor.
2. Click the **Inventory Management** tab.
3. From the **Select view type** list box, select **View by location**.

   This lists the plates in the inventory database by location.
4. Select the plates that you want to inventory.

   You can use SHIFT + click to select a range of listed plates.
5. In the **Name** text box, type the name of the location group.
6. From the **Labware** list box, select the type of labware to associate.



7. Select one of the following options:

Option	Comments
Replace any inventoried labware with the labware type selected above	Labware types for all selected items are replaced with the labware type in the list box. This overwrites labware types already assigned.
Replace inventoried labware with the labware type selected above ONLY if a labware type is not already assigned	Labware types for all selected items that do not already have a labware entry are replaced with the indicated labware type.

8. Click **Reinventory selected locations**.

   A bar code reader reads each plate in the storage device and adds the bar code data to the inventory database.

Related information

For information about...	See...
Inventory groups, plate groups and location groups	"About inventory groups" on page 311
Moving plates in and out of a storage device	❑ "Moving plates into a storage device" on page 318 ❑ "Moving stored plates out of the system" on page 321 ❑ "Moving plates between storage devices" on page 324
Changing the labware associated with plates in the inventory database	"Reinventorying the plate inventory" on page 333
Inventory editor filters	"Inventory editor views and filters" on page 331

13 Setting labware definitions

This chapter is for people with Administrator or Technician privileges.

About defining labware with the labware editor

About this topic

This topic introduces the labware editor, which is used to define labware (plates, lids, tip boxes, and so on) that can be used by devices.

Labware editor defined

The labware editor is the VWorks interface through which users enter information about labware.

You must be logged on with an Administrator or Technician user account to use the labware editor.

Types of information stored

Two main types of information are stored in the labware database:

- ❑ Information about the physical plate properties
- ❑ Information about labware classes

About physical properties

Plates, lids, tip boxes, and other labware have properties such as width, length, and number of wells.

Without the labware editor, you would have to enter values for the many properties associated with a plate each time you set up a protocol. But, with the labware editor, all you have to do is select the type of labware to use.

About labware classes

Labware classes are sets of labware entries, grouped so they are easier to manage than many individual labware entries.

Labware classes are used in combination with the device manager to restrict which types of labware can be used on which devices during a protocol run. This helps to prevent wasted runs and damage to the devices on the platform.

An example of how damage can be prevented by labware restriction is where a tipbox that is too tall for a device crashes into the device as the robot delivers it.

Labware editor overview

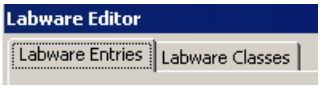
About this topic

This topic gives an overview of the organization of the labware editor's user interface.

Labware Editor pages

The labware editor has two tabbed pages:

- ❑ Labware Entries—where labware definitions are entered
- ❑ Labware Classes—where defined labware is assigned to classes



Labware Entries page

Sub-pages

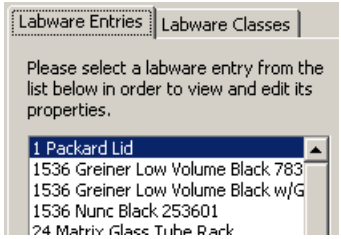
The Labware Entries page has the following sub-pages:

- ❑ Plate Properties
- ❑ Stacker
- ❑ VPrep/Well Definition
- ❑ Image
- ❑ Labware Classes

The sub-page tabs are located at the bottom of the page. (Some tabs may be hidden if they are not relevant.)

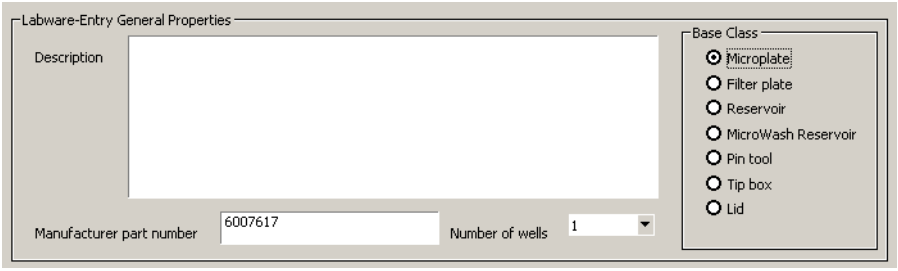
Labware selection box

The labware selection box, which is the left-hand column, is the same on each page.


Labware Entries
Labware Classes
Please select a labware entry from the list below in order to view and edit its properties.
1 Packard Lid
1536 Greiner Low Volume Black 783
1536 Greiner Low Volume Black w/G
1536 Nunc Black 253601
24 Matrix Glass Tube Rack

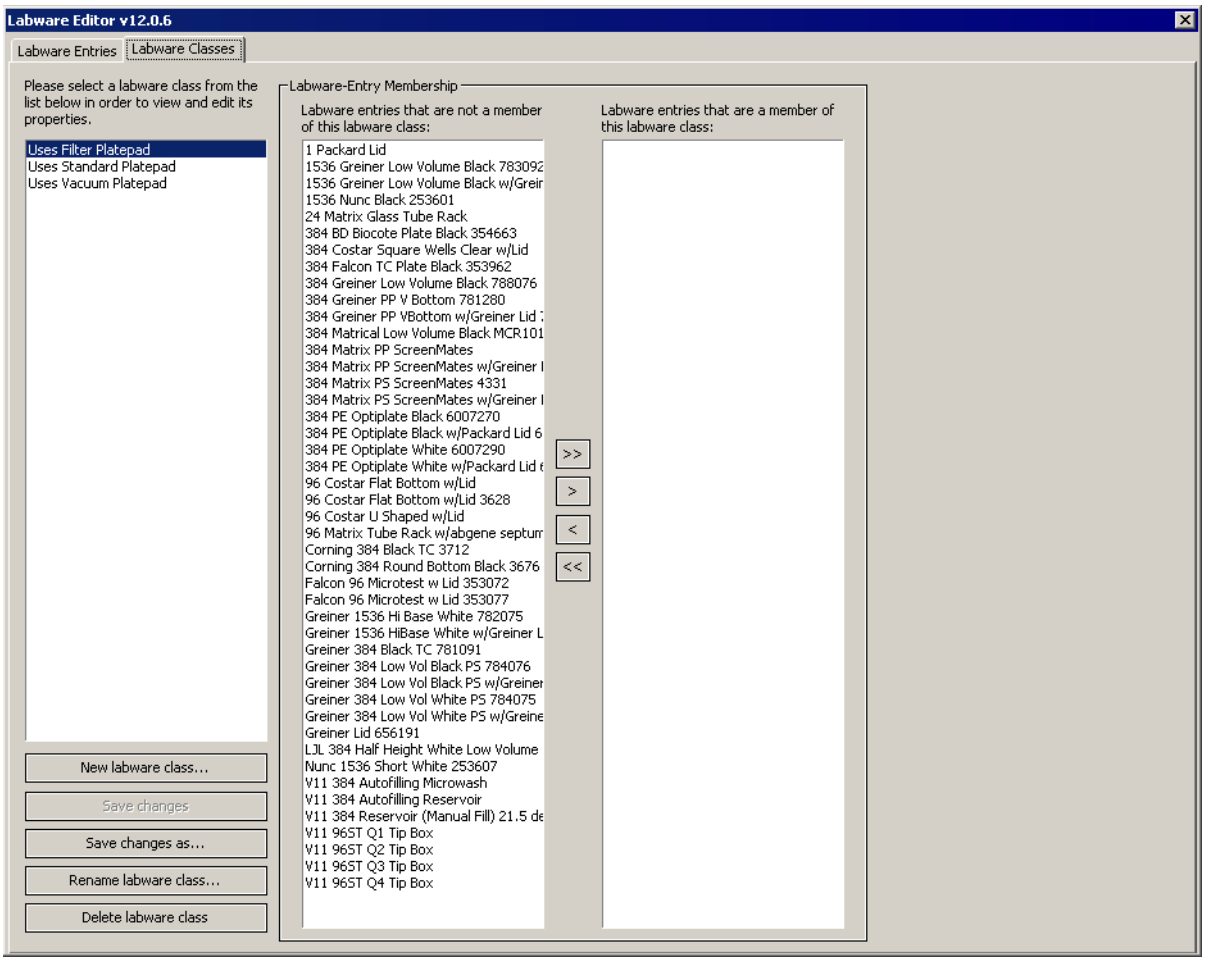
Labware-Entry General Properties group box

Each sub-page has an identical Labware-Entry General Properties group box.



Labware Classes page

In the Labware Classes page, you create labware classes and assign defined labware to a labware class.


Labware Editor v12.0.6
Labware Entries
Labware Classes
Please select a labware class from the list below in order to view and edit its properties.
Uses Filter Platepad
Uses Standard Platepad
Uses Vacuum Platepad
Labware-Entry Membership
Labware entries that are not a member of this labware class:
Labware entries that are a member of this labware class:
1 Packard Lid
1536 Greiner Low Volume Black 783092
1536 Greiner Low Volume Black w/Greir
1536 Nunc Black 253601
24 Matrix Glass Tube Rack
384 BD Biocote Plate Black 354663
384 Costar Square Wells Clear w/Lid
384 Falcon TC Plate Black 353962
384 Greiner Low Volume Black 788076
384 Greiner PP V Bottom 781280
384 Greiner PP VBottom w/Greiner Lid
384 Matrical Low Volume Black MCR101
384 Matrix PP ScreenMates
384 Matrix PP ScreenMates w/Greiner
384 Matrix PS ScreenMates 4331
384 Matrix PS ScreenMates w/Greiner
384 PE Optiplate Black 6007270
384 PE Optiplate Black w/Packard Lid 6
384 PE Optiplate White 6007290
384 PE Optiplate White w/Packard Lid
96 Costar Flat Bottom w/Lid
96 Costar Flat Bottom w/Lid 3628
96 Costar U Shaped w/Lid
96 Matrix Tube Rack w/abgene septum
Corning 384 Black TC 3712
Corning 384 Round Bottom Black 3676
Falcon 96 Microtest w Lid 353072
Falcon 96 Microtest w Lid 353077
Greiner 1536 Hi Base White 782075
Greiner 1536 HiBase White w/Greiner L
Greiner 384 Black TC 781091
Greiner 384 Low Vol Black PS 784076
Greiner 384 Low Vol Black PS w/Greiner
Greiner 384 Low Vol White PS 784075
Greiner 384 Low Vol White PS w/Greine
Greiner Lid 656191
LJL 384 Half Height White Low Volume
Nunc 1536 Short White 253607
V11 384 Autofilling Microwash
V11 384 Autofilling Reservoir
V11 384 Reservoir (Manual Fill) 21.5 de
V11 96ST Q1 Tip Box
V11 96ST Q2 Tip Box
V11 96ST Q3 Tip Box
V11 96ST Q4 Tip Box
>>
>
<
<<
New labware class...
Save changes
Save changes as...
Rename labware class...
Delete labware class

Labware standards

!! IMPORTANT !! All labware (including deepwell and PCR plates) used with Velocity11 products must conform to the SBS microplate standards. Please visit www.sbsonline.org **for current SBS standards, or contact your labware's manufacturer.**

Opening the labware editor

About this topic

This topic explains how to open the labware editor.

You open the labware editor when you want to:

- ❑ View existing labware entries or classes
- ❑ Edit labware entries or classes
- ❑ Add new labware entries or classes
- ❑ Delete labware entries or classes
- ❑ Rename labware entries or classes

Before you start

You must be logged on with an Administrator or Technician user account to open the labware editor.

Procedure

To open the labware editor:

1. In VWorks, click **Diagnostics**.

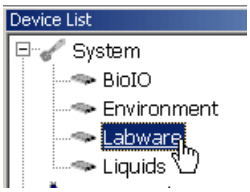
2. In the **Diagnostics** pop-up window, expand the system icon if necessary.
3. Click **Labware** to select it.
4. Click **Device Diagnostics**.

Alternate procedures

You can also open the labware editor from the device manager and from the protocol editor.

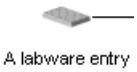
To open the labware editor from the device manager:

1. Click the **Device Manager** tab.
2. In the **Device List** toolbar, expand **System** and double-click **Labware**.

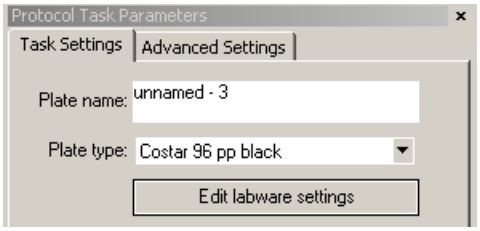


To open the labware editor from the protocol editor:

1. Click the **Protocol Editor** tab.
2. Select a plate icon.



3. In the **Task Parameters** toolbar, click the **Edit labware settings** button.



Adding a labware entry

About this topic

This topic describes how to add a labware entry. The first step in defining labware, such as a plate, is to create a labware entry for it.

Before you start

You must be logged on with an Administrator or Technician user account to perform this procedure.

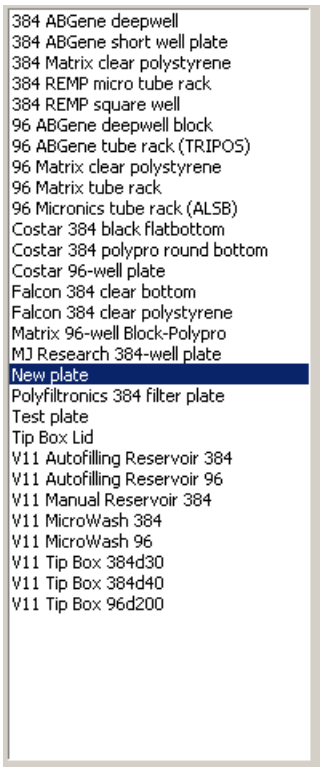
Procedure

To add a labware entry:

1. Open the labware editor.
2. Under the labware selection box on the left of the window, click **New labware entry**.

3. In the **New Labware Entry** dialog box, enter a name for the plate and click **OK**.

   The entry appears in the labware selection box.



Related information

For information about...	See...
Opening the labware editor	“Opening the labware editor” on page 341

Deleting a labware entry

About this topic

This topic describes how to delete a labware entry. If there is a labware entry that you no longer need, you can delete it.

Before you start

Make sure that the entry you are deleting is not referenced in protocols.

!! IMPORTANT !! If you delete a labware entry that is already referenced in protocols, the link between the protocol and the labware data will be broken and the protocol will not run.

You must be logged on with an Administrator or Technician user account to perform this procedure.

Procedure

To delete a labware entry:

1. Open the labware editor.
2. In the labware selection box on the left of the window, select the labware entry to be deleted.
3. Click **Delete labware entry**.
4. In the **V11Labware** dialog box, click **Yes** to delete the entry.

Related information

For information about...	See...
Opening the labware editor	“Opening the labware editor” on page 341

Renaming a labware entry

About this topic

This topic describes how to change the name of a labware definition.

Before you start

Make sure that the entry you are renaming is not already referenced in protocols.

!! IMPORTANT !! If you rename a labware entry that is already referenced in protocols, the link between the protocol and the labware data will be broken and the protocol will not run.

You must be logged on with an Administrator or Technician user account to perform this procedure.

Procedure

To rename a labware entry:

1. Open the labware editor.
2. In the labware selection box on the left of the window, select the labware entry to be renamed.
3. Click **Rename labware entry**.
4. In the **V11Labware** dialog box, click **OK** to confirm that you want to rename this entry.
5. In the **Rename Labware Entry** dialog box, enter the new name for the plate and click **OK**.

Related information

For information about...	See...
Opening the labware editor	“Opening the labware editor” on page 341

Copying a labware entry

About this topic

To save time when creating a new entry that is similar to an existing one, you can copy an existing labware entry. This topic describes how to copy a labware entry.

Before you start

You must have an Administrator or Technician user account to perform this procedure.

Procedure

To copy a labware entry:

1. Open the labware editor.
2. In the labware selection box on the left of the window, select a labware entry.
3. Click **Save changes as**.
4. In the **Save Labware Entry As** dialog box, type a name for the new entry that is different from the selected one, and click **OK**.

   The copied entry appears in the labware selection box.

Related information

For information about...	See...
Opening the labware editor	“Opening the labware editor” on page 341

Defining general properties

About this topic

After adding a labware entry, you need to define the general properties of the labware. The general properties describe the type of labware that is being entered into the database and are visible on all of the sub-pages of the labware editor.

This topic describes how to enter these general properties that define the labware.

Before you start

You must have a Technician or Administrator user account to perform this procedure.

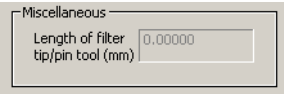
You must have added a labware entry that you want to define.

Procedure

To define the general properties of a piece of labware:

1. Open the labware editor.
2. In the **Description** text box, type in a description of the labware, if desired.
3. For your reference, in the **Manufacturer part number** text box, enter the part number for the labware.
4. In the **Number of wells** list box, select the number of wells in the plate.
5. In the **Base Class** group box, select one of the options.

   The option you select determines which labware editor properties are available. For example, when a base class of **Microplate** is selected, the **Length of filter tip/pin tool (mm)** property is unavailable.



Related information

For information about...	See...
Opening the labware editor	“Opening the labware editor” on page 341
Creating a labware entry (before defining it)	“Adding a labware entry” on page 342
What to do next	“Defining plate properties” on page 348

Defining plate properties

About this topic

This topic describes the parameters used to define a plate or other piece of labware in the Plate Properties sub-page of the labware editor.

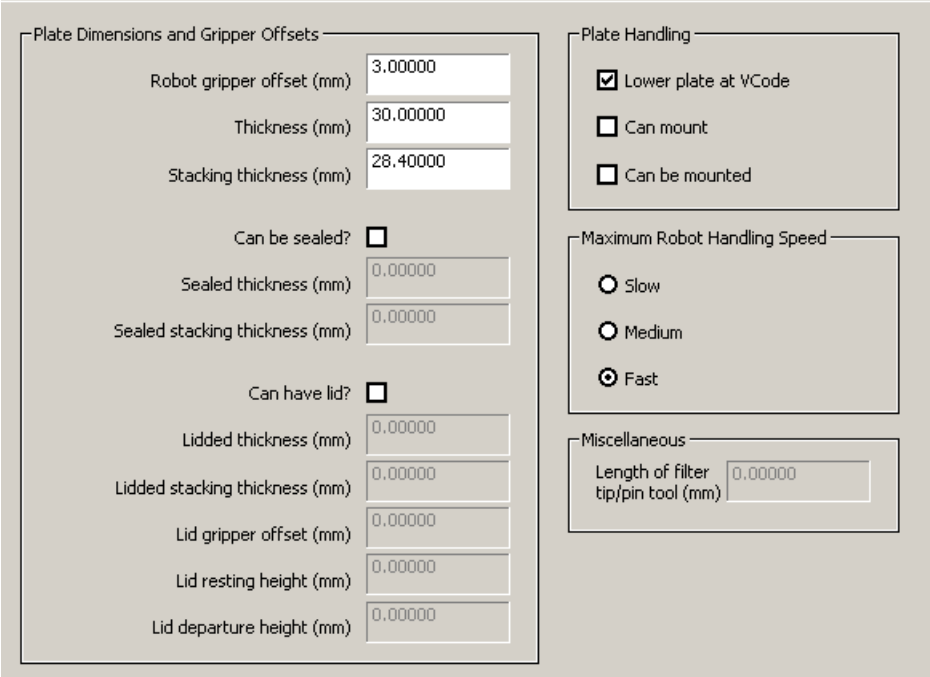
Defining plate properties

To define plate properties:

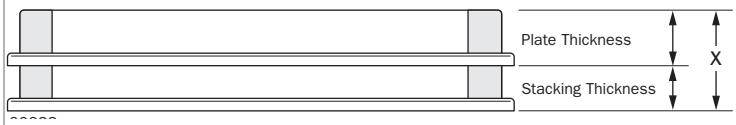
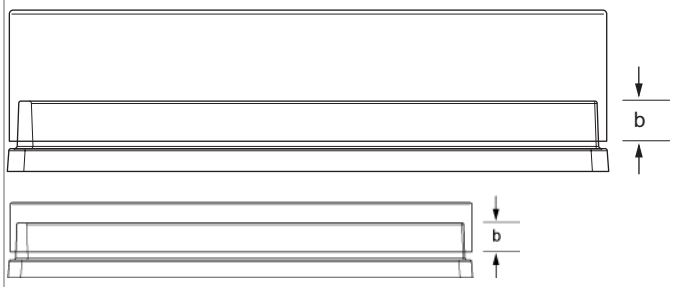
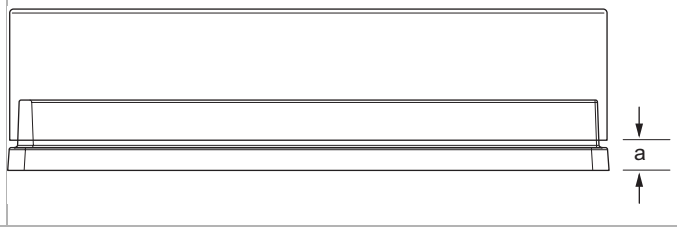
1. Click the **Plate Properties** sub-page tab of the labware editor.
2. Enter the values for the available parameters according to the type of plate or labware you are defining.

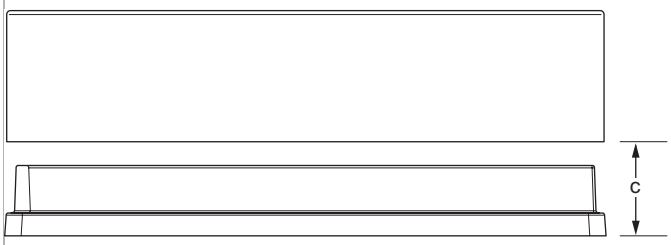
   The parameters on the **Plate Properties** sub-page are described in the following screenshot and table.

   Note: Only the parameters associated with the **Base Class** you selected in the **General Properties** group box will be available.



Property	Description
Robot gripper offset	Height of the gripper above any teachpoint when the robot is picking or placing a plate of this type. The value is typically 0–3 mm.
Thickness	The distance, in millimeters, from the bottom surface of the plate to the top surface of the plate. Measure using calipers.

Property	Description
Stacking thickness	The thickness, in millimeters, of two stacked plates minus the thickness of one plate (see above row). Measure using calipers. Example: Thickness of two stacked plates (x) = 23.14 mm Thickness of one plate = 14.14 mm Stacking thickness: 23.14 mm - 14.14 mm = 9.00 mm 
Can be sealed?	Select if the plate can be sealed.
Sealed thickness	Thickness of the plate with a seal in place. Available only if **Can be sealed?** is selected.
Sealed stacking thickness	Stacking thickness of the plate with the a seal in place. Available only if **Can be sealed?** is selected.
Can have lid?	Select if the plate can have a lid.
Lidded thickness	Thickness of the plate with a lid in place. Available only if **Can have lid?** is selected.
Lidded stacking thickness	Stacking thickness of the plate with the a lid in place. Available only if **Can have lid?** is selected.
Lid gripper offset	Height above the lid resting height at which to grip the lid. (Shown as *b* below.) 
Lid resting height	Height above the bottom of the plate at which the bottom of a plate lid rests. (Shown as *a* below.) 

Property	Description
Lid departure height	Height above the bottom of the plate to which the lid is lifted. 
Lower plate at VCode	Select if the plate has a thick skirt and must be lowered when on the stage of the VCode. This allows the VCode to place the label above the thick skirt.
Can mount	Select if the plate can be placed on top of another plate. This property is for filter plates that are placed on top of waste plates during filtration steps of a protocol.
Can be mounted	Select if another plate can be placed on top of this plate. This property is for waste plates that collect filtrate from filter plates during the filtration steps of a protocol. Many different plates may be able to fit under any one type of filter plate. **!! IMPORTANT !! The wells of the waste plate must have a large enough diameter that the filter plate does not stick on the waste plate. The robot must be able to pick up the filter plate without the waste plate lifting up with it.**
Maximum robot handling speed	Defines the maximum speed at which this type of plate should be moved. The general robot speed is set in VWorks. If the plate-specific robot speed (set here) is different from the general robot speed, the slower of the two speeds is used.
Length of filter tip/pin tool	Use calipers to measure the length (in millimeters) of the filter tip or pin tool in filter and pin tool plates.

Related information

For information about...	See...
Opening the labware editor	“Opening the labware editor” on page 341
Creating a labware entry (before defining it)	“Adding a labware entry” on page 342
Defining general properties	“Defining general properties” on page 347
What to do next	“Defining stacker properties” on page 351

Defining stacker properties

About this topic

This topic describes the parameters used to define a plate or other piece of labware (except reservoirs) in the Stacker sub-page of the labware editor.

Some stacker properties are used to make adjustments that avoid having to change teachpoints, which might otherwise cause problems.

Who should read this

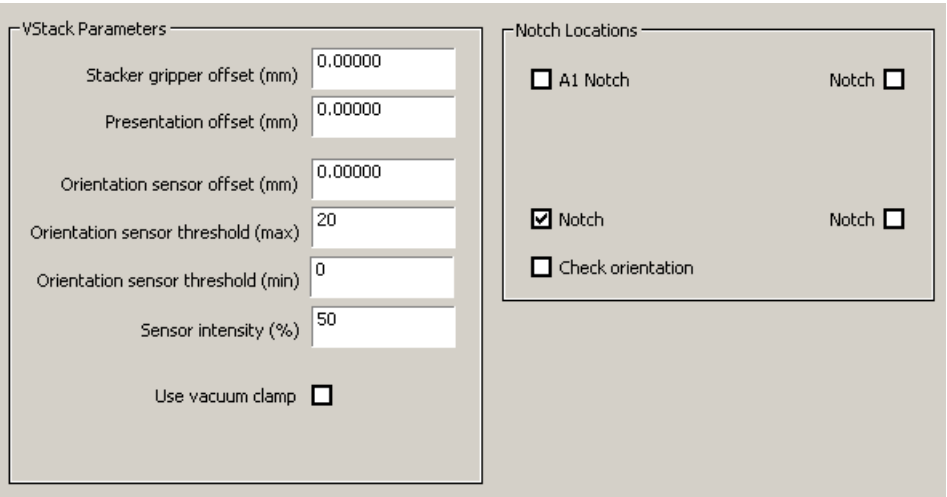
Because stacker properties only apply to the VStack, only those administrators or technicians who define labware for use with the VStack, should read this topic.

Defining properties

To define stacker properties:

1. Click the **Stacker** sub-page tab of the labware editor.
2. Enter the values for the available parameters according to the type of plate or labware you are defining.

   The properties on the **Stacker** sub-page are described in the following screenshot and table.



Property	Description
Stacker gripper offset	Adjusts the height at which the plate stage stops for the grippers to grip the plate, with respect to the robot's Grip teachpoint. Change this value only if the robot is not gripping the plates correctly.

Property	Description
Stacker gripper offset	Adjusts the height at which the plate stage stops for the grippers to grip the plate, with respect to the VStack's Grip teachpoint. Change this value only if the stacker is not gripping the plates correctly.
Presentation offset	Adjusts the height of the VStack plate stage with respect to the presentation teachpoint of a VStack.
Orientation sensor offset	Adjusts the height at which the orientation checking sensors "view" the plate, with respect to the VStack's sensor teachpoint. If the orientation sensor offset is 0 mm, the bottom of the plate during orientation checking should be in the same plane as the sensors.
Orientation sensor threshold (max)	Determines the highest intensity of the detected light at which the stacker senses a notch when the plate stage is in the orientation sensor position. If the stacker does not sense a notch when it should, adjust the sensor threshold value. The maximum value is 255.
Orientation sensor threshold (min)	Determines the lowest intensity of the detected light at which the stacker senses a notch when the plate stage is in the orientation sensor position. If the stacker does not sense a notch when it should, adjust the sensor threshold value.
Sensor intensity	Sets the percentage of maximum sensor intensity for all sensors. If the sensor intensity is set too low, a plate will not be detected even though one is present. If it is set too high, the sensors may become saturated, causing failure to detect the orientation of a plate. This property adjusts for the fact that clear, black, and white plates reflect light differently. For example, white plates generally reflect more light so the sensor intensity should be set lower.
Use vacuum clamp	Obsolete.

Property	Description
Notch locations	Looking at the plate from the perspective of the robot, select the corresponding notch or notches for your plate in the Notch Locations group box.
Check orientation	When checked, turns on plate orientation checking.

Related information

For information about...	See...
Opening the labware editor	“Opening the labware editor” on page 341
Creating a labware entry (before defining it)	“Adding a labware entry” on page 342
Defining general properties	“Defining general properties” on page 347
Defining plate properties	“Defining plate properties” on page 348
What to do next	“Defining VPrep/well properties” on page 354

Defining VPrep/well properties

About this topic

This topic describes the parameters used to define a plate or other piece of labware in the VPrep/Well Definition sub-page of the labware editor.

Who should read this

Because the properties described in this topic only apply to the VPrep and Multimek, only those administrators or technicians who define labware for use with these devices should read this topic.

Defining properties

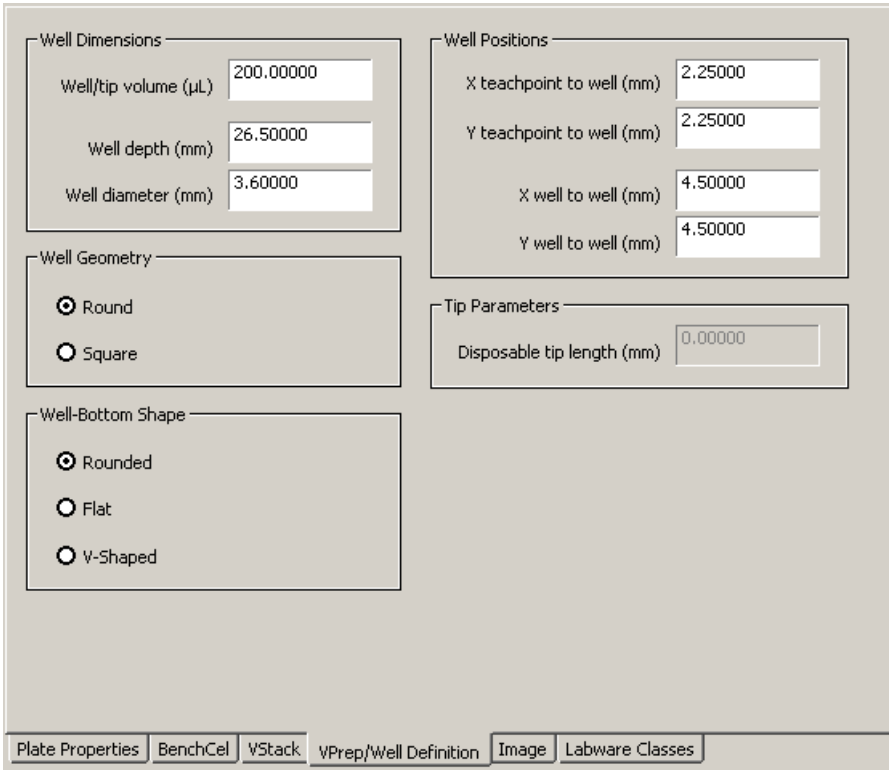
To define VPrep/well properties:

1. Click the **VPrep/Well Definition** sub-page tab of the labware editor.
2. Enter the values for the available parameters according to the type of plate or labware you are defining.

   The properties on the **VPrep/Well Definition** sub-page are described in the following screenshot and table.

   Properties on this sub-page are only used for the VPrep and the Multimek.

   Note: Use calipers to carefully measure the labware you are defining in the labware editor.



Property	Description
Well/tip volume	Maximum volume of fluid for one tip or well, in microliters
Well depth	Distance from the top of the plate to the bottom of the well, in millimeters
Well diameter	Diameter of the well, in millimeters
Well Geometry	Shape of the wells. Options are Round or Square.
Well-Bottom Shape	Shape of the well bottoms. Options are Rounded, Flat, or V-Shaped.
X teachpoint to well	Distance from the teachpoint to the center of the A1 well along the *x* direction (number axis), in millimeters. This setting should be 0 mm for standard 96-well plates and 2.25 mm for standard 384-well plates.
Y teachpoint to well	Distance from the teachpoint to the center of the A1 well along the *y* direction (letter axis), in millimeters. This setting should be 0 mm for standard 96-well plates and 2.25 mm for standard 384-well plates.
X well to well	Distance from well-center to well-center in the *x* direction, in millimeters. This setting should be 9 mm for standard 96-well plates and 4.5 mm for standard 384-well plates.
Y well to well	Distance from well-center to well-center in the *y* direction, in millimeters. This setting should be 9 mm for standard 96-well plates and 4.5 mm for standard 384-well plates.
Disposable tip length	Length of the disposable tips being used, in millimeters.

Related information

For information about...	See...
Opening the labware editor	“Opening the labware editor” on page 341
Creating a labware entry (before defining it)	“Adding a labware entry” on page 342
Defining general properties	“Defining general properties” on page 347
Defining plate properties	“Defining plate properties” on page 348
Defining stacker properties	“Defining stacker properties” on page 351
What to do next	“Inserting an image” on page 356

Inserting an image

About this topic

This topic describes how to add an image of the labware to the Image sub-page of the labware editor.

Before you start

Make sure that the image file you want to add is in the JPG, GIF, or BMP format.

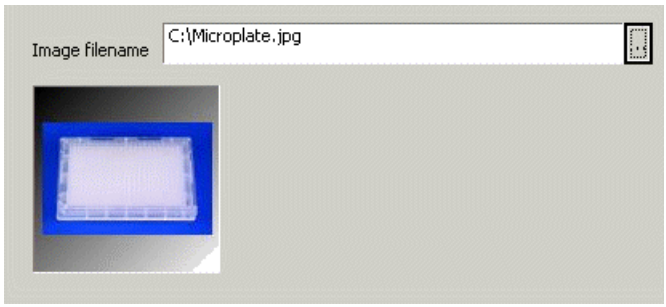
Procedure

To insert an image:

1. Click the **Image** sub-page tab of the labware editor.
2. Click the ellipsis button (...), and browse to the folder location of the image file.

3. Double-click the image file.

   The image appears below in the user interface.



Related information

For information about...	See...
Opening the labware editor	“Opening the labware editor” on page 341
Creating a labware entry (before defining it)	“Adding a labware entry” on page 342
Defining general properties	“Defining general properties” on page 347
Defining plate properties	“Defining plate properties” on page 348
Defining stacker properties	“Defining stacker properties” on page 351
Defining VPrep well properties	“Defining VPrep/well properties” on page 354
What to do next	“Defining labware classes” on page 357

Defining labware classes

About this topic

This topic explains how to set up labware classes.

About labware classes

Labware classes contain labware entries.

When you set up a device, you can associate labware classes with the device to indicate what labware can (and cannot) be used with the device.

Before you create labware classes, consider what labware you want allowed or prohibited on each of your devices.

VWorks comes with three labware classes ready defined:

- ❑ Uses Filter Platepad
- ❑ Uses Standard Platepad
- ❑ Uses Vacuum Platepad

Two places to define classes

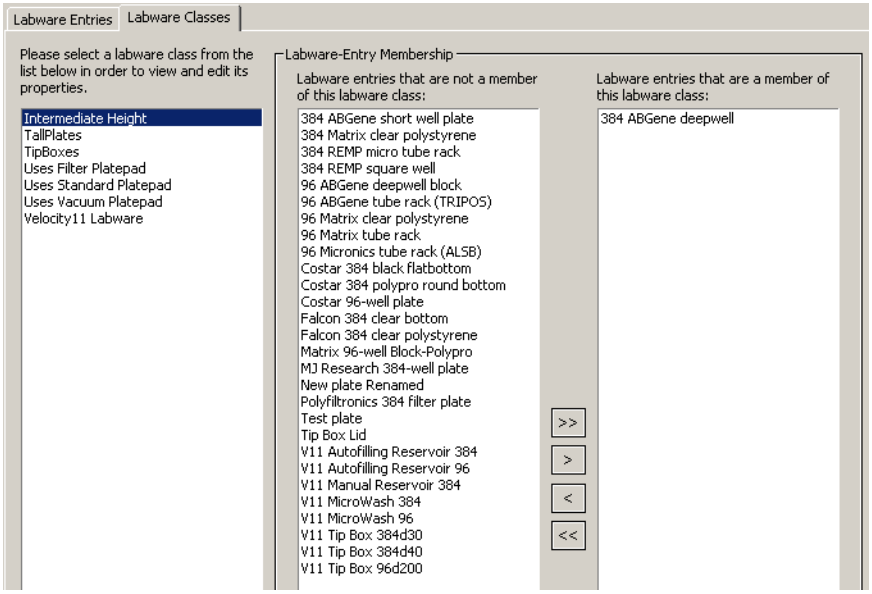
You can view and define which plate types are associated with which labware classes in:

- ❑ The Labware Classes page
- ❑ The Labware Classes sub-page of the Labware Entries page

These views present the same information in different ways.

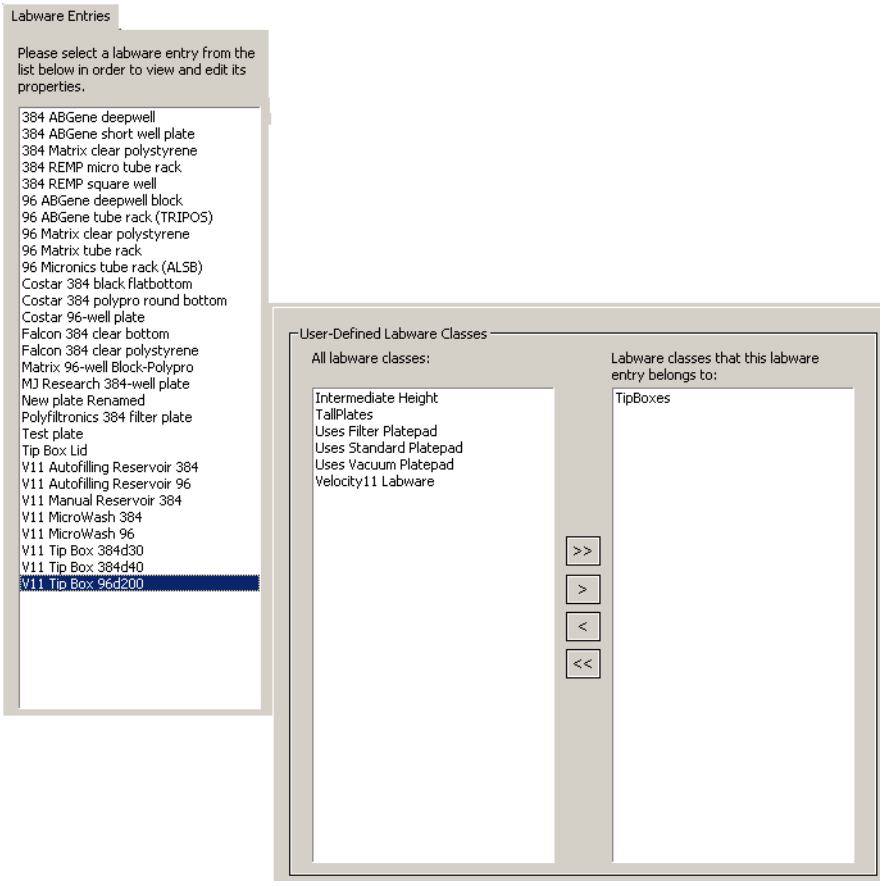
About the Labware Classes page

In the Labware Classes page, if you select a class in the labware selection box on the left, the plate types that are members of that class are displayed in the far right-hand column.



About the Labware Classes sub-page

In the Labware Classes sub-page, if you select a type of plate in the labware entry box on the left, the far right-hand column displays the classes that it is a member of.



Procedure

To add a labware class:

1. Open the labware editor.
2. In the **Labware Classes** page, click **New labware class**.
3. Under the labware selection box on the left of the window, click **New labware entry**.
4. In the **New Labware Class** dialog box, enter a name for the plate and click **OK**.

   The entry appears in the list of labware classes.

To associate a type of plate with a labware class:

1. Open the labware editor.
2. In the **Labware Classes** page or **Labware Classes** sub-page, select an item from the middle column.

   To select more than one item, use SHIFT-click or CTRL + click. If you want to move all entries, click **> >**.
3. Click **>** to move the labware entries or labware classes to the right-hand column.
4. Click **Save Changes** to save your changes. Or, if you are in the **Labware Classes** page, you can click **Save Changes As** to save as a new labware class.

Related information

For information about...	See...
Opening the labware editor	"Opening the labware editor" on page 341
Creating a labware entry (before defining it)	"Adding a labware entry" on page 342
Defining general properties	"Defining general properties" on page 347
Defining plate properties	"Defining plate properties" on page 348
Defining stacker properties	"Defining stacker properties" on page 351
Defining VPrep well properties	"Defining VPrep/well properties" on page 354
Associating an image with a labware entry to make the entry easily recognized	"Inserting an image" on page 356

Setting liquid-handling definitions 14

This chapter is for people:

- With Administrator or Technician privileges
- Who write protocols that use VPrep and Multimek pipettors.

This chapter describes how to view and set up liquid classes that determine how liquids are pipetted.

About the liquid library editor

About this topic

This topic introduces the liquid library editor, which is used to define liquid classes (pipetting properties for liquids).

Definition

The liquid library editor is a dialog box through which users with Technician or Administrator privileges can enter values for properties that affect pipetting speed, accuracy and precision.

Liquid classes

The values entered into the liquid library editor can be saved as a collection, known as a liquid class. Using liquid classes saves time when writing protocols because you do not have to enter values for the liquid properties every time you create a protocol.

Liquid library database

The data that represents a liquid class is saved to the liquid library database, which is maintained in the Windows registry.

Using a liquid class

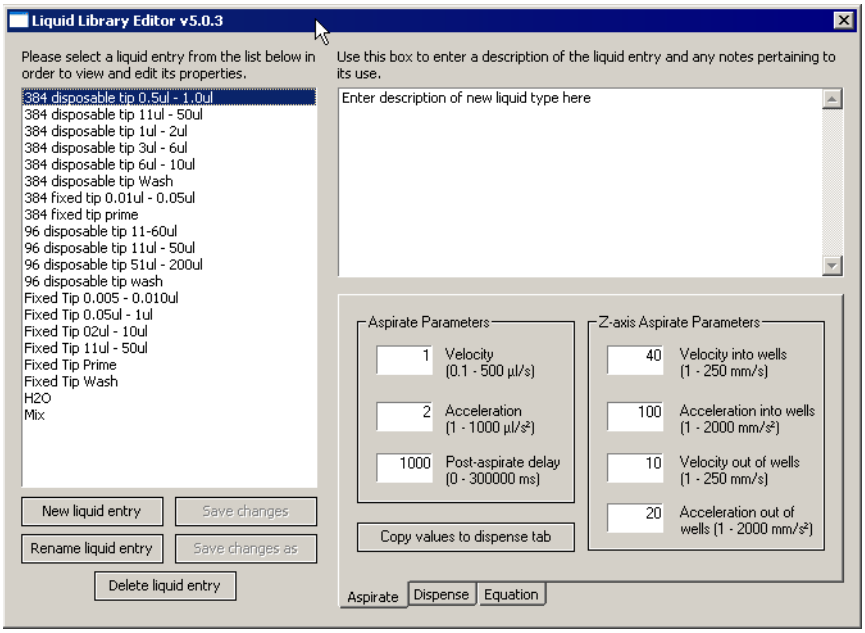
When preparing for a protocol run, you select the liquid class that you want to use. Then, during the run, the liquid class values are referenced for pipetting operations.

Equation editor

The liquid library editor also has an equation editor that can be used to calibrate the VPrep.

Screenshot

A screenshot of the liquid library editor is shown below.


Liquid Library Editor v5.0.3
Please select a liquid entry from the list below in order to view and edit its properties.
384 disposable tip 0.5ul - 1.0ul
384 disposable tip 11ul - 50ul
384 disposable tip 1ul - 2ul
384 disposable tip 3ul - 6ul
384 disposable tip 6ul - 10ul
384 disposable tip Wash
384 fixed tip 0.01ul - 0.05ul
384 fixed tip prime
96 disposable tip 11-60ul
96 disposable tip 11ul - 50ul
96 disposable tip 51ul - 200ul
96 disposable tip wash
Fixed Tip 0.005 - 0.010ul
Fixed Tip 0.05ul - 1ul
Fixed Tip 02ul - 10ul
Fixed Tip 11ul - 50ul
Fixed Tip Prime
Fixed Tip Wash
H2O
Mix
New liquid entry
Save changes
Rename liquid entry
Save changes as
Delete liquid entry
Use this box to enter a description of the liquid entry and any notes pertaining to its use.
Enter description of new liquid type here
Aspirate Parameters
1 Velocity (0.1 - 500 µl/s)
2 Acceleration (1 - 1000 µl/s²)
1000 Post-aspirate delay (0 - 300000 ms)
Z-axis Aspirate Parameters
40 Velocity into wells (1 - 250 mm/s)
100 Acceleration into wells (1 - 2000 mm/s²)
10 Velocity out of wells (1 - 250 mm/s)
20 Acceleration out of wells (1 - 2000 mm/s²)
Copy values to dispense tab
Aspirate
Dispense
Equation

Opening the liquid library editor

About this topic

This topic explains how to open the liquid library editor.

You open the liquid library editor when you want to:

- ❑ View the properties that are defined for a liquid class
- ❑ Edit the properties that are defined for a liquid class
- ❑ Add new liquid classes

Before you start

You must be logged on with an Administrator or Technician user account to open the liquid library editor.

Procedure

To open the liquid library editor from VWorks:

1. Click the **Device Manager** tab.
2. In the **Device List**, select **Liquids** from the **System** device.
3. Click **Device Diagnostics**.

   The **Liquid Library Editor** opens.

Related information

For information about...	See...
Creating a new liquid class entry	“Creating a liquid class” on page 364
The liquid library editor	“About the liquid library editor” on page 362

Creating a liquid class

About this topic

This topic describes how to create a new liquid class.

Before you start

You must be logged on with an Administrator or Technician user account to perform this procedure.

Types of liquid classes to create

You may want to create different classes for different:

- ❑ Types of liquids

  For example, water vs. DMSO
- ❑ Volumes of liquids

  For example, 1 µL vs. 200 µL
- ❑ Liquid operations

  For example, washing vs. mixing

Procedure

To create a liquid class:

1. Open the liquid library editor.
2. Click **New liquid entry**.
3. In the **New Liquid Entry** dialog box, enter a name for the liquid class and click **OK**.
4. In the **Note** text box at the top right, type a note describing the liquid library entry for your records.
5. Enter values for the aspirate properties.

   The following table describes these properties.

Aspirate property	Definition
Velocity	Specifies the speed of the aspiration stroke, in microliters per second.
Acceleration	*VPrep only.* Specifies acceleration during the aspiration stroke, in microliters per second squared.
Z-axis velocity into wells	Specifies how fast the pipettor moves as the tips enter the wells, in millimeters per second.
Z-axis acceleration into wells	*VPrep only.* Specifies the acceleration of the pipettor as the tips move into the wells, in millimeters per second squared.
Z-axis velocity out of wells	Specifies how fast the tips leave the wells, in millimeters per second.

Aspirate property	Definition
Z-axis acceleration out of wells	*VPrep only.* Specifies the acceleration of the pipettor as the tips move out of the wells, in millimeters per second squared.
Post-aspirate delay	Specifies the time the pipettor waits after aspiration is complete before moving the tips out of the wells, in milliseconds.

6. Enter values for the dispense properties.

   The following table describes these properties.

Dispense property	Definition
Velocity	Specifies the maximum speed of the dispensing stroke, in microliters per second.
Acceleration	*VPrep only.* Specifies acceleration during the dispensing stroke, in microliters per second squared.
Z-axis velocity into wells	Specifies how fast the pipettor moves as the tips enter the wells, in millimeters per second.
Z-axis acceleration into wells	*VPrep only.* Specifies the acceleration of the pipettor as the tips enter the wells, in milliliters per second squared.
Z-axis velocity out of wells	Specifies how fast the pipettor moves as the tips leave the wells, in millimeters per second.
Z-axis acceleration out of wells	*VPrep only.* Specifies the acceleration of the pipettor as the tips leave the wells, in millimeters per second squared.
Post-dispense delay	Specifies the time the pipettor waits after the dispense stroke before moving the tips out of the wells, in milliseconds.

7. Click **Save changes**.

   The changes are now stored in the liquid library database.

Related information

For information about...	See...
Opening the liquid library editor	"Opening the liquid library editor" on page 363
Calibrating a pipettor	"Performing an accuracy calibration" on page 366
The liquid library editor	"About the liquid library editor" on page 362

Performing an accuracy calibration

About this topic

This topic describes how to improve the accuracy of VPrep pipetted volumes by:

- ❑ Calibrating the pipettor
- ❑ Plotting the actual volume dispensed as a function of the set volume set to dispense
- ❑ Calculating the polynomial coefficients of the plot
- ❑ Entering the coefficients into the liquid library equation editor

Do you need to calibrate your pipettor?

Pipetting accuracy is the ability to dispense an absolute volume of liquid. In practice, the volume that is actually dispensed by a pipettor may be different from the dispense volume that you select. This difference is the absolute error.

In some protocols, as long as you dispense an excess of liquid, the actual volume pipetted is not important. In other protocols, pipetting accuracy can be a critical factor. You must remember, though, that every step of an experiment has error and there is no point taking the time to improve the accuracy of pipetting to four significant figures if another step in your protocol has error at the third significant figure.

If you are sure that the overall error of the experiment is limited by pipetting accuracy, and error at this number of significant figures makes a practical difference to your interpretation of the data, consider performing an accuracy calibration.

Method overview

This section gives an overview of the method you can use to measure pipetting accuracy. It does not give a detailed procedure because that depends on exactly how you choose to conduct the experiment.

To calibrate a pipettor, an independent method of measuring dispensed volume is required. One method is to dispense a solution of fluorescein dye and measure the fluorescence emitted from each plate well.

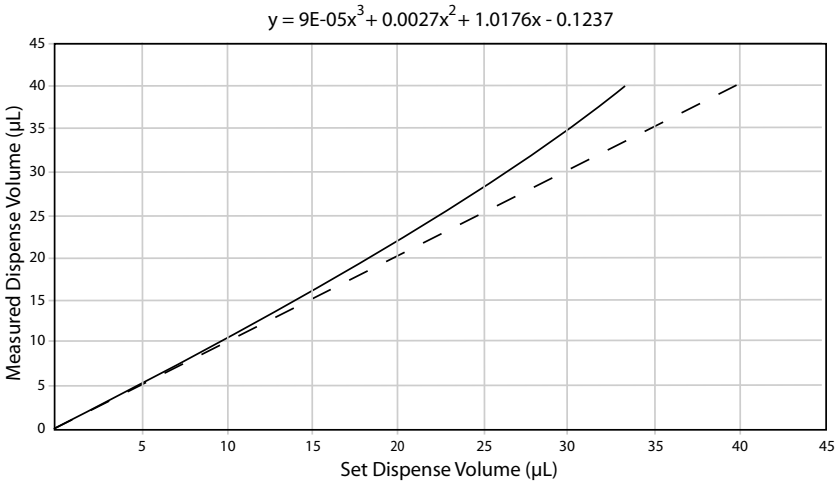
!! IMPORTANT !! Whichever method you use, verify that the error of the detection method is significantly smaller than the pipetting error. Otherwise, the error you detect may be due to the detection method and not the pipetting error.

The overall method is:

1. Perform a series of pipetting operations in which different volumes are pipetted.
2. Measure the volumes of dispensed liquid using the independent measuring method.
3. In a spreadsheet program, tabulate the dispense volumes that you set in the software against the measured volumes.
4. Plot a graph, with the set dispense volume on the y-axis and measured dispense volume on the x-axis.

   The plot will be a curve, reflecting the fact that absolute error is a function of the magnitude of the measurement.
5. Use the statistical functions of the spreadsheet program to fit a curve to the data.

   Your result may look like this:



   The dashed line is a reference line, where the set dispense volume equals the measured dispense volume. The equation is the polynomial for the line, calculated by the spreadsheet program.
6. Enter the curve information into the equation editor of the liquid library editor.

If you repeat the experiment, you will find that the curve is much closer to a straight line. This is because the equation you entered adjusts the action of the servo motor that determines aspirate and dispense volumes, thereby calibrating the dispense.

Using the equation editor

The equation editor in the liquid library editor is where you enter the calibration curve data to correct for pipetting inaccuracy.

To enter a polynomial into the equation editor:

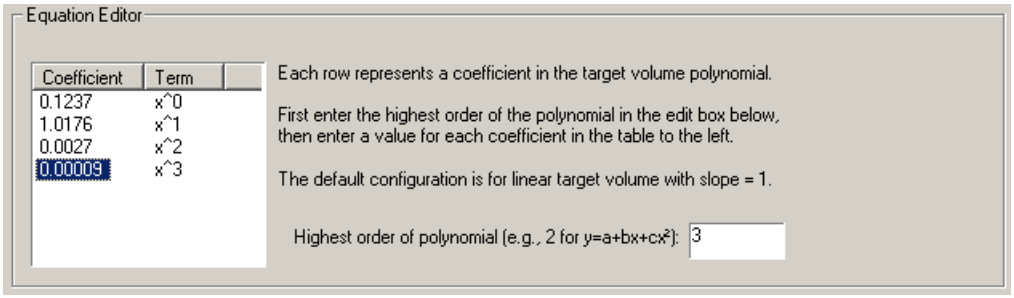
1. In the text box, enter the value for the highest order of the polynomial.

   This is the largest exponent in the equation and tells you how many terms are in the equation. For example, if the highest order of the polynomial is 3, the equation will have the general form: $y = a + bx + cx^2 + dx^3$, and four terms. With an exponent of three, four rows are added to the equation editor table.

2. In the equation editor table, in turn, enter the coefficient and exponent for each of the terms in the equation, starting with the zero order term.

   To enter a value, single-click the **Coefficient** table row twice. Note that the exponents are already entered for you and cannot be edited.

   The following example is for the curve displayed in the graph above.


Equation Editor
Coefficient
Term
0.1237
x^0
1.0176
x^1
0.0027
x^2
0.00009
x^3
Each row represents a coefficient in the target volume polynomial.
First enter the highest order of the polynomial in the edit box below, then enter a value for each coefficient in the table to the left.
The default configuration is for linear target volume with slope = 1.
Highest order of polynomial (e.g., 2 for y=a+bx+cx²):
3

3. Click **OK**.

Administrator procedures

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This chapter is for people with Administrator login privileges. It describes assorted administrative tasks, including how to:

- Administer user accounts
- Import and export VWorks data from the registry of your computer
- Set up email so that you can send bug reports from within VWorks

About user accounts and privileges

About this topic

You must have a user account to log in to VWorks. Your user account is associated with a user role that determines the privileges you have to perform particular functions.

This topic describes the privileges associated with different user roles.

The effect of privileges

Privileges have the following effects:

- ❑ If you do not have the privilege to perform a function associated with a particular menu command, the text of the command is gray.
- ❑ If you do not have the privilege to perform the functions accessed from a particular tabbed page, the tab is not visible to you.
- ❑ In some cases, if you do not have the privilege to perform an operation, when you attempt the operation you get an error message telling you that your privileges are insufficient.

User roles and privileges

User roles enforce the following privileges:

User role	Has privileges to...
Guest	Run existing protocols.
Operator	❑ Perform Guest functions (see above). ❑ Operate devices in real time using diagnostics software.
Technician	❑ Perform Operator functions (see above). ❑ Create and save protocols. ❑ Edit the labware database and liquid library database.
Administrator	❑ Perform Technician functions (see above). ❑ Manage devices through the device manager. ❑ Create and delete user accounts. ❑ Run a protocol that contains compiler errors.
Velocity11	Perform any function. Used by Velocity11 personnel only.

Adding and deleting a user account

About this topic

We recommend that VWorks administrators create an account for every user. The privileges set for the account should be appropriate for the user's job role.

This topic explains how to add and delete user accounts.

About blank passwords

!! IMPORTANT !! If you do not assign a password to a user, a blank password is automatically assigned. This means that anybody can log in.

Adding a user account

You must be logged in with an Administrator user account to add a user account.

To add a user account:

1. Select **Tools** > **Manage Users**.
2. In the **User Editor** dialog box, click **Add**.
3. In the **User name** text box, type a name for the user.
4. From the **Access level** list box, select the privilege that you want to assign to the user.
5. Assign a password:
   a. Click **Change password**.
   b. Enter a password in the **New** text box.
   c. Re-type the password in the **Confirm New** text box.
   d. Click **OK**.
6. Click **OK**.

Deleting a user account

You must be logged in with an Administrator user account to delete a user account.

To delete a user account:

1. Select **Tools** > **Manage Users**.
2. In the **User name** text box, select the user you want to delete.
3. Click **Delete**.

   If you attempt to delete the account that is currently in use, you receive an error message.
4. In the **Confirm Delete** dialog box, click **Yes**.

   The password is deleted.

Moving or sending a registry file

About this topic

This topic provides instructions on how to export a Windows registry file for import to another computer or for emailing to Velocity11.

When to do this

- ❑ To propagate a labware or liquid library database to other devices using a different controlling computer
- ❑ To email a labware or liquid library database when requested by personnel at Velocity11

About moving data

The labware and liquid libraries are maintained in the Windows registry of the controlling computer.

When you use VWorks to make a change to the labware or liquid libraries, the change is seen when accessing that information from the networked instrument's software. This is because VWorks and instrument software run on the same controlling computer and access the same databases.

If you make a change to the labware or liquids database, you can use a two-step process to propagate the change to another computer.

1. Export the Windows registry key containing the data to a file.
2. Import the file to the other computer's registry.

Important

!! IMPORTANT !! Making a mistake when editing the registry may cause critical failures with your operating system.

Exporting a registry key

To export a registry key:

1. From the Windows **Start** menu, select **Run**.
2. In the **Open** text box, type `regedit`.
3. Click **OK**.

   The Windows registry editor opens.
4. Expand folders to display the following folder:

   HKEY_LOCAL_MACHINE\SOFTWARE\Velocity11\Shared
5. Expand the **Shared** folder and select either:
   - Labware
   - Liquid Library
6. From the **Registry** (or **File**) menu, select **Export**.

   The **Export Registry File** browser box opens.
7. Navigate to the folder in which you want to save the file.
8. In the **File name** text box, type a name of your choice for the file.
9. If you are moving the file to a computer with a different Windows operating system, select the appropriate recipient operating system from the **Save as type** list box, if one is available.
10. Click **Save**.
11. Select **Registry** > **Exit** (or **File** > **Exit)** to close the registry editor.

Importing a registry key

To import a registry key:

1. Copy the registry file to any location on the recipient computer.
2. On the recipient computer, double-click the registry file.

   The information in the file will be written automatically to the registry.

Emailing a registry file

Occasionally, you may be asked to send a registry file to Velocity11.

To email a registry file:

1. Export the Windows registry key containing the data to a file.
2. Zip the file or change its extension to .re_ (This is necessary because many Exchange servers do not allow *.reg files to be emailed.)
3. Email the file.

Setting up email

About this topic

This topic describes how to set up your VWorks email so that you can send a bug report to Velocity11 or be notified of run errors by a page or email.

When to use

Email setup in VWorks enables you to do the following tasks:

- ❑ Automatically be notified by email or pager when errors occur during a protocol run
- ❑ Send a bug report to Velocity11

Requirements for email setup

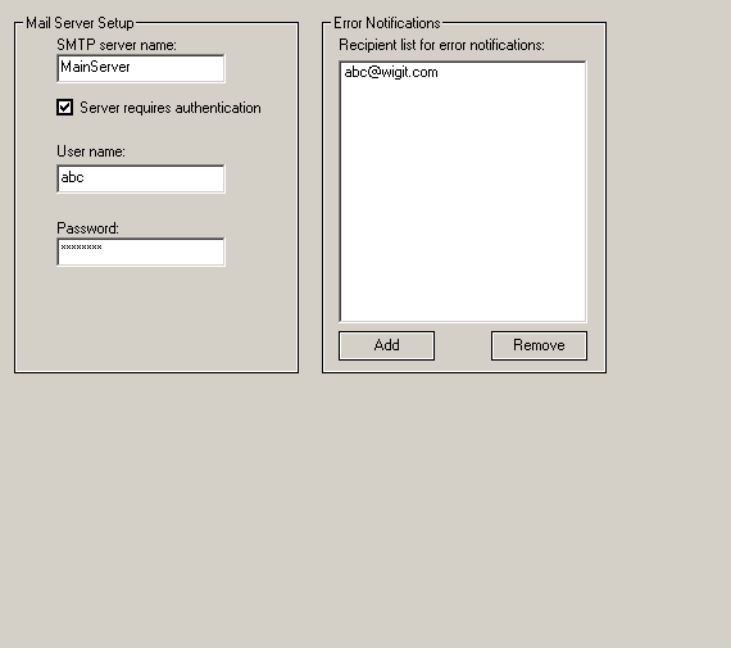
Before you can send an email from VWorks:

- ❑ The VWorks computer must be connected to a network with internet access.
- ❑ The outgoing email server must be set up on the system's computer.

Setting up email

To set up the outgoing email server:

1. Select **Tools > Options**.
2. In the **VWorks Options** dialog box, click the **Email Setup** tab.
3. In the **Mail Server Setup** group box, enter the name of your **SMTP server name** (outgoing email server).
4. If the server requires a user name and password:
   a. Select the **Server requires authentication** check box.
   b. Enter the **User name** and **Password** that you use to access email on the network.



This information only needs to be set up once, provided the email account remains active. All email sent from VWorks is authenticated using this account.

Related information

For more information about...	See...
Sending a bug report	“Sending a bug report” on page 518

AliQuot: setting up and using

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This chapter is for people with Administrator or Technician privileges.

The AliQuot is a low-volume liquid dispenser for the delivery of reagents, reaction mixes, cells, beads, chemical solutions, and liquids into 96-, 384- and 1536-well microplates that can be integrated into a lab automation system that is run using VWorks.

This chapter describes how to configure the Genetix AliQuot, set the AliQuot task parameters and use AliQuot Diagnostics.

Workflow for configuring the AliQuot

About this topic

This topic gives the workflow for configuring the AliQuot in VWorks.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating an AliQuot profile" on page 379
3.	"Setting the generic properties for a device" on page 112
4.	"Setting AliQuot device properties" on page 382

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Setting AliQuot task parameters	"Setting the AliQuot task parameters" on page 384
Using AliQuot Diagnostics	"Using AliQuot Diagnostics" on page 385
Performing a fill test	"Performing a fill test" on page 386

Creating an AliQuot profile

About this topic

This topic describes how to create a profile for the AliQuot.

Before you start

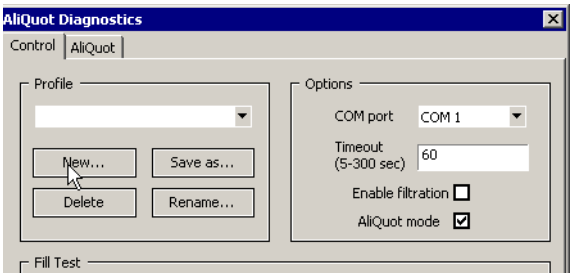
Before you can create a profile, you must add the AliQuot to the device manager.

Procedure

To create an AliQuot profile:

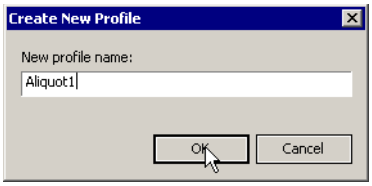
1. Open **AliQuot Diagnostics**.
2. Make sure that the **AliQuot mode** check box is selected.

   Note: If this check box is not selected, the title bar will read QFill2. This is because the same underlying code is used to operate the AliQuot and QFill devices.



3. In the **Profile** group box, click **New**.

   Enter a name in the **Create New Profile** dialog box and click **OK**.



Setting the profile attributes

A profile defines the communication and other basic settings between the controlling computer and AliQuot device.

Changes to some of the other settings can be made in the AliQuot Diagnostics but these are not saved in a profile and are therefore lost when you exit VWorks.

The following settings are saved in an AliQuot profile:

Setting	Diagnostics page	Comments
AliQuot mode	Control	The AliQuot check box must be selected in the profile.
AliQuot purge on or off	AliQuot	Select On if you want to periodically push fluid through the lines. This can remove blockages in the line.
AliQuot purge time	AliQuot	Enter the duration of the purge operation.
AliQuot purge interval	AliQuot	Enter the time between purges.
COM port	Control	This is the number of the serial port to which the AliQuot is connected. If you have more than one AliQuot on your system, you must select the port for the device with which you want to communicate.
Filtration port	Filtration	This is the Bio I/O port used to communicate with the optional AliQuot filtration unit. If you have more than one AliQuot using filtration, you will need to select the number that corresponds to the filtration unit with which you want to communicate.

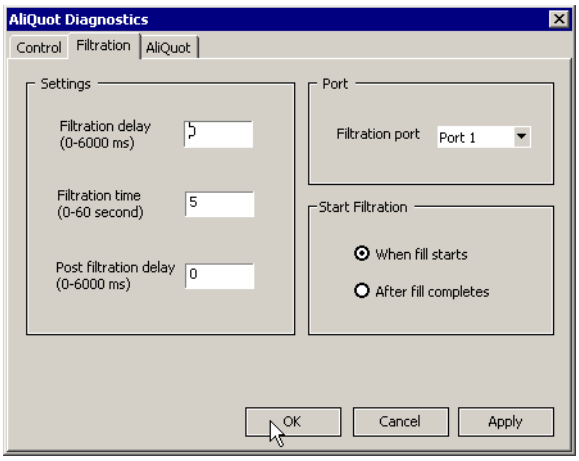
Procedure

To choose the attributes for the profile:

1. In the **Options** group box, select the communications port on the computer that the AliQuot is connected to from the **COM port** list box.
2. If required, in the **Timeout** field, enter a different time that you want the computer to wait for a response from the AliQuot indicating that the fill operation is complete.

   The default value is 60 seconds.
3. If you want vacuum filtration:
   a. On the **Control** page, select **Enable filtration**.

      The **Filtration** tab appears.



   b. In the **Start Filtration** group box, select **When fill starts** to start the filtration at the same time that the dispense begins, or **After fill completes** to start the filtration when the dispense is finished.
   c. If you want a delay between the time the start filtration signal is sent to the AliQuot and the beginning of the vacuum pull, enter a value for **Filtration delay**.
   d. In the **Filtration time** field, enter a duration for the vacuum pull.
   e. If you want a delay between the end of the filtration and when the end of the operation is reported, enter a value for **Post Filtration delay**.
4. Click the **AliQuot** tab and choose whether you want auto purge on or off.
5. If you select **Auto purge on**, enter the time to purge in the **AliQuot purge time** field and the time between purges in the **AliQuot purge interval** field.
6. Click **OK**.

   The diagnostics dialog box closes saving the profile settings.

Related information

For information about...	See...
Profiles	"About profiles" on page 103
Adding a device	"Adding devices" on page 107
Opening AliQuot Diagnostics	"Opening diagnostics software" on page 105
The next step	"Setting the generic properties for a device" on page 112
The workflow this topic belongs to	"Workflow for configuring the AliQuot" on page 378
Setting AliQuot task parameters	"Setting the AliQuot task parameters" on page 384
Using AliQuot Diagnostics	"Using AliQuot Diagnostics" on page 385
Performing a fill test	"Performing a fill test" on page 386

Setting AliQuot device properties

About this topic

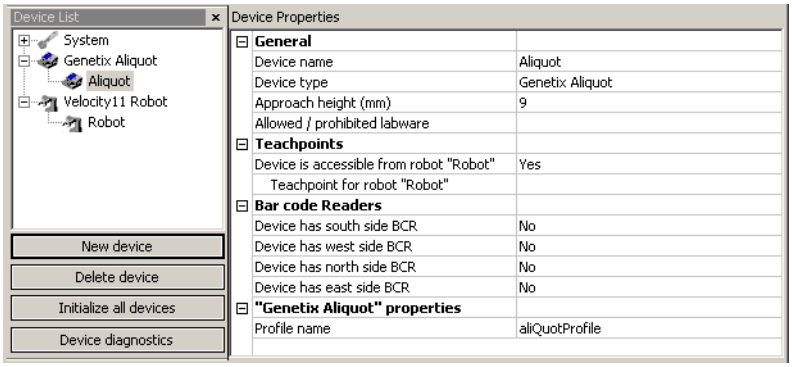
This topic describes how to set the AliQuot device properties.

The device properties provides VWorks with additional information about the AliQuot's current configuration. The device property settings are stored in the device file.

Procedure

To set the AliQuot's device properties:

1. Open the **Device Properties** page.
2. Set the AliQuot's generic properties.



3. If not already selected, double-click in the field adjacent to **Profile name.**
4. Choose a profile from the list box.
5. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
Adding a device	“Adding devices” on page 107
Opening the Device Properties page	“Adding devices” on page 107
The workflow this topic belongs to	“Workflow for configuring the AliQuot” on page 378
Creating an AliQuot profile	“Creating an AliQuot profile” on page 379
Setting the generic properties	“Setting the generic properties for a device” on page 112
Setting AliQuot task parameters	“Setting the AliQuot task parameters” on page 384
Using AliQuot Diagnostics	“Using AliQuot Diagnostics” on page 385
Performing a fill test	“Performing a fill test” on page 386

Setting the AliQuot task parameters

About this topic

This topic describes how to set the AliQuot task parameters in the VWorks.

Aliquot task defined

The AliQuot task moves a plate to an AliQuot where liquid is dispensed into the plate.

Procedure

To set Aliquot task parameters:

1. Add the **Aliquot** task to the protocol.
2. In the **Task Settings** page of the **Protocol Task Parameter** toolbar, type the volume of liquid that you want to dispense in the **Enter dispense volume** text box.
3. In the **Available devices** list, select the AliQuot device that you want to use for this task and click **Add**.

   The name of the device moves to the **Devices to use** list.
4. If you intend to use a filter plate:
   a. Select the **Use filtration** check box.
   b. Complete the **Begin filtration...** sentence to enter the remaining parameters.

      The **After filtration delay** is the time after the filtration has stopped before the plate can be picked up.

      !! DAMAGE HAZARD !! If the After filtration delay is too short, the robot may crash.

Related information

For information about...	See...
Adding tasks to protocols	"Adding a task or pipette task" on page 168
Adding a device	"Adding devices" on page 107
Configuring the AliQuot	"Workflow for configuring the AliQuot" on page 378
Setting AliQuot task parameters	"Setting the AliQuot task parameters" on page 384
Using AliQuot Diagnostics	"Using AliQuot Diagnostics" on page 385
Performing a fill test	"Performing a fill test" on page 386

Using AliQuot Diagnostics

About this topic

You can use the AliQuot Diagnostics to manage profiles and run a test fill.

This topic describes how to edit, delete, and rename profiles.

Procedure

Open the Control page of the AliQuot Diagnostics dialog box:

1. Open **AliQuot Diagnostics**.
2. Select **AliQuot** mode.
3. Click the **Control** tab.

To modify an existing profile:

1. From the **Profile** list box of the **Control** tab, select the desired profile.
2. Edit the profile settings and click **OK** to save and close the dialog box or, click **Apply** to initialize the device with the modified profile.

To create a profile based on an existing profile:

1. From the **Profile** list box of the **Control** tab, select the profile you want to copy.
2. Click **Save As**.
3. In the **Save Profile As** dialog box, replace the name with a new one and click **OK**.
4. Edit the profile settings and click **OK** to save and close the dialog box or, click **Apply** to initialize the device with the new profile.

To delete a profile:

1. From the list box of the **Control** tab, select the profile you want to delete.
2. Click **Delete**.
3. In the **alert** dialog box, click **Yes** to delete the profile.

To rename a profile:

1. From the **Profile** list box of the **Control** tab, select the profile you want to rename.
2. Click **Rename**.
3. In the **Rename Profile** dialog box, select the existing name and type in the new name and click **OK**.

Related information

For information about...	See...
Opening AliQuot Diagnostics	"Opening diagnostics software" on page 105
Create a profile	"Creating an AliQuot profile" on page 379
Adding a device	"Adding devices" on page 107
Configuring the aliQuot	"Workflow for configuring the AliQuot" on page 378
Setting aliQuot task parameters	"Setting the AliQuot task parameters" on page 384
Performing a fill test	"Performing a fill test" on page 386

Performing a fill test

About this topic

This topic describes how to use AliQuot Diagnostics to perform a fill test.

The general process for performing a manual operation on the AliQuot is the following:

1. Select or create a profile that has the basic settings you require for the operation.
2. Define the other settings not stored in the profile.
3. Perform a fill test.

Procedure

To perform a test fill:

1. Select or create a profile that has the settings you require.
2. In the **Fill Test** group box, click in the text box and type the volume of liquid to dispense into each well of the plate.
3. Click **Fill**.

   The plate fills.

Related information

For information about...	See...
Create a profile	“Creating an AliQuot profile” on page 379
Adding a device	“Adding devices” on page 107
Configuring the AliQuot	“Workflow for configuring the AliQuot” on page 378
Setting AliQuot task parameters	“Setting the AliQuot task parameters” on page 384
Managing profiles	“Using AliQuot Diagnostics” on page 385

17 Bio-Tek: setting up and using

This chapter is for people with Administrator or Technician privileges.

The Bio-Tek ELx405 is an automated microplate washer that can be integrated into a lab automation system that is run using VWorks.

This chapter describes how to configure the Bio-Tek, set Bio-Tek task parameters and use Bio-Tek Diagnostics.

Workflow for configuring the Bio-Tek

About this topic

This topic gives the workflow for configuring the Bio-Tek in VWorks.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Setting the generic properties for a device" on page 112
3.	"Setting the Bio-Tek device properties" on page 390

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Setting Bio-Tek task parameters	"Setting the Bio-Tek task parameters" on page 392
Using Bio-Tek Diagnostics	"Using Bio-Tek Diagnostics" on page 393

Setting the Bio-Tek device properties

About this topic

This topic describes how to set the Bio-Tek device properties.

The device properties provides VWorks with information about the Bio-Tek's current configuration. The device properties settings are stored in the device file.

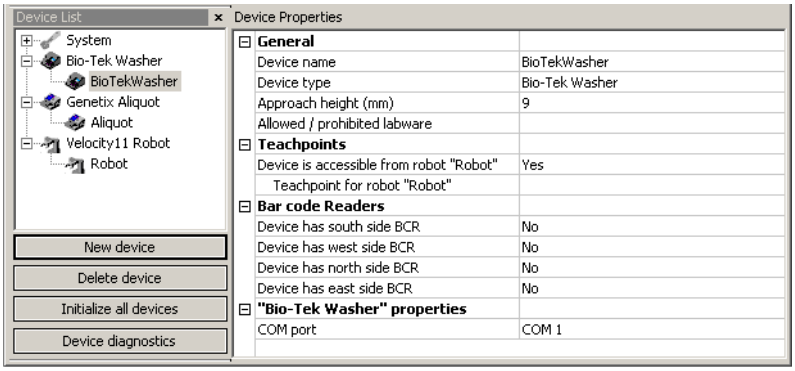
Before you start

Before you can set the Bio-Tek device properties, you need to add the Bio-Tek device to the device manager.

Procedure

To set the Bio-Tek device properties:

1. Open the Bio-Tek **Device Properties** page.
2. Set the Bio-Tek's generic properties.



3. Under the **Bio-Tek Washer properties** group, double-click in the field adjacent to **COM port.**
4. From the list box, select the port connecting the Bio-Tek Washer to the controlling computer
5. Save the **Device Properties** settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
Opening the device properties	"Adding devices" on page 107
Setting the generic properties	"Setting the generic properties for a device" on page 112
The workflow this procedure belongs to	"Workflow for configuring the Bio-Tek" on page 390
Adding a device	"Adding devices" on page 107
Setting Bio-Tek task parameters	"Setting the Bio-Tek task parameters" on page 392
Using Bio-Tek Diagnostics	"Using Bio-Tek Diagnostics" on page 393

Setting the Bio-Tek task parameters

About this topic

This topic describes how to set the Bio-Tek Washer task parameters.

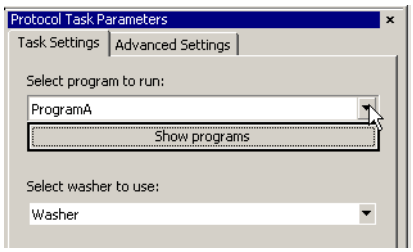
Bio-Tek Washer task defined

The Bio-Tek Washer task moves a plate to the Bio-Tek where a pre-selected wash program is executed.

Procedure

To set Bio-Tek Washer task parameters:

1. Add a Bio-Tek Washer task to a protocol.
2. From the **Select program to run** list box in the **Protocol Task Parameters** toolbar, select the program that you want to run.



3. If you want to see the parameters used for that program, modify a program, or create a program, click **Show Programs**.

   This opens the **Bio-Tek Washer Diagnostics** dialog box.
4. If your system has more than one Bio-Tek washer, select the one to use for this task from the **Select washer to use** list box.

Related information

For information about...	See...
Setting the Bio-Tek Device Properties	"Setting the Bio-Tek device properties" on page 390
Adding a device	"Adding devices" on page 107
Adding tasks to protocols	"Adding a task or pipette task" on page 168
Workflow for configuring the Bio-Tek	"Workflow for configuring the Bio-Tek" on page 390
Using Bio-Tek Diagnostics	"Using Bio-Tek Diagnostics" on page 393

Using Bio-Tek Diagnostics

About this topic

This topic describes how to use the Bio-Tek Washer Diagnostics to:

- ❑ Set basic properties
- ❑ Create a program
- ❑ Execute a program manually

The Bio-Tek ELx405 can be controlled through the built-in keypad on the washer. In addition, Velocity11 has developed a user interface (Bio-Tek Active X) to allow you to operate an ELx405 using a computer that is running VWorks.

!! IMPORTANT !! If you create a program, through the ELx405, you will not be able to access it through Bio-Tek Active X in VWorks. Conversely, if you create a program through the Bio-Tek Active X, you will not be able to access it through the built-in keypad.

About linked programs

You cannot create linked programs using Bio-Tek Washer Active X in VWorks. Instead, you can add two or more consecutive Bio-Tek Washer tasks to a protocol.

Setting basic properties

To set the basic properties:

1. In the **Protocol Task Parameters** toolbar, click **Show Programs** to open the **Bio-Tek Washer Diagnostics** dialog box.
2. From the **Program list** box of the **Bio-Tek Washer Diagnostics** dialog box, select a program.
3. From the **Select washer to use** list box, select the model of ELx405 that you have.

   !! IMPORTANT !! If you select the wrong model, VWorks will freeze when you run the program through either Bio-Tek Diagnostics or a VWorks protocol.
4. From the **Plate type** list box, select the type of plate.
5. From the **Program type** list box, select the type of program to run.

   For more information about types of programs, see the *Bio-Tek ELx405 Washer Operator's Guide*.
6. From the **Buffer valve** list box, select the valve corresponding to the reagent that you want to use.
7. Click **Save** and close the dialog box.

Creating a program

You can create a program, which is a named collection of parameter settings, from the Bio-Tek Washer Diagnostics dialog box.

To create a program:

1. Open **Bio-Tek Diagnostics**.
2. Click **New**.
3. Type a name for the program in the **New Program** dialog box.
4. Click **OK**.
5. Complete the parameter settings, as required, in the **Bio-Tek Washer Diagnostics** dialog box.

   Refer to the parameter tables below and the parameters described in the *Bio-Tek ELx405 Washer Operator's Guide*.
6. Click **Save**.

Running a program

Bio-Tek Diagnostics programs

You can run any program that was created using Bio-Tek Washer Diagnostics software.

!! IMPORTANT !! Before running a program, make sure that the Bio-Tek Washer display does not read "UNDER EXTERNAL CONTROL." If it does, VWorks will freeze when you run the program and you will have to end the application from the Microsoft Windows Task Manager.

To run a program:

1. Select the program from the **Program list** box.
2. Click **Run**.

Standard programs

The Bio-Tek Washer includes a number of standard programs, for uses such as measuring the accuracy and precision of dispense volumes.

To run a standard program:

1. Select the program from the **Standard program** list box.
2. Click **Run**.

Parameter tables

Some of the parameter names used in Bio-Tek Washer Diagnostics are slightly different to the names given in the *Bio-Tek ELx405 Washer Operator's Guide*. The names that are different are listed in the following tables to help you when looking up information.

Aspirate

The following table shows the equivalent parameter names for aspirating.

Velocity11 Bio-Tek Diagnostics label	Bio-Tek parameter
Horizontal position	Horizontal Aspr Pos
Horizontal y-position	Horizontal Y Aspr Pos
Crosswise aspirate options	Crosswise On
Crosswise aspirate height	Crosswise Height
Crosswise horizontal position	Crosswise Horiz Pos
Crosswise horizontal y- position	Crosswise Horiz Y Pos
Final aspirate delay	Final Aspr Delay

Dispense Parameters

The following table shows the equivalent parameter names for dispensing.

Velocity11 Bio-Tek Diagnostics label	Bio-Tek parameter
Prime before dispense	Prime Before Start
Dispense volume per well	Dispense Volume
Horizontal position	Horizontal Disp Pos
Horizontal y-position	Horiz Y Disp Pos
Bottom wash volume	Bottom Disp Volume
Bottom wash flow rate	Bottom Flow Rate
Bottom wash height	Bottom Disp Height
Bottom wash horizontal position	Bottom Horiz Pos
Bottom wash horizontal y-position	Bottom Horiz Y Pos

Related information

For information about...	See...
Setting Bio-Tek device properties	"Setting the Bio-Tek device properties" on page 390
Opening Bio-Tek Diagnostics	"Opening diagnostics software" on page 105
Setting Bio-Tek's generic device properties	"Setting the generic properties for a device" on page 112
Adding a device	"Adding devices" on page 107
Workflow for configuring the Bio-Tek	"Workflow for configuring the Bio-Tek" on page 390
Setting Bio-Tek task parameters	"Setting the Bio-Tek task parameters" on page 392

Echo 550: Setting up and using 18

This chapter is for people with Administrator or Technician privileges.

The Echo 550 transfers drops of liquid between microplates for compound reformatting applications.

This chapter describes how to configure the Labcyte Echo 550, set the Labcyte Echo 550 task parameters and use Echo 550 Diagnostics.

Workflow for configuring Echo 550 devices

About this topic

This topic presents the workflow for configuring the Echo 550 in VWorks.

The Labcyte Echo 550 device is configured as three parts in VWorks:

- ❑ Labcyte Echo 550
- ❑ Labcyte Echo 550 source stage
- ❑ Labcyte Echo 550 destination stage

All three components must be added as devices in the device manager.

When configuring the Labcyte Echo 550 device you first create a profile for the Echo 550 and then configure each stage as a child of the Echo 550.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating an Echo 550 profile" on page 399
3.	"Setting the generic properties for a device" on page 112
4.	"Setting the Echo 550 device properties" on page 400
5.	"Setting the generic properties for a device" on page 112
6.	"Setting the Echo 550 source stage device properties" on page 402
7.	"Setting the generic properties for a device" on page 112
8.	"Setting the Echo 550 destination stage device properties" on page 403

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Setting Echo 550 task parameters	"Setting Echo 550 task parameters" on page 404
Using Echo 550 Diagnostics	"Using Echo 550 Diagnostics" on page 408

Creating an Echo 550 profile

About this topic

This topic describes how to create a profile for the Echo 550 in VWorks.

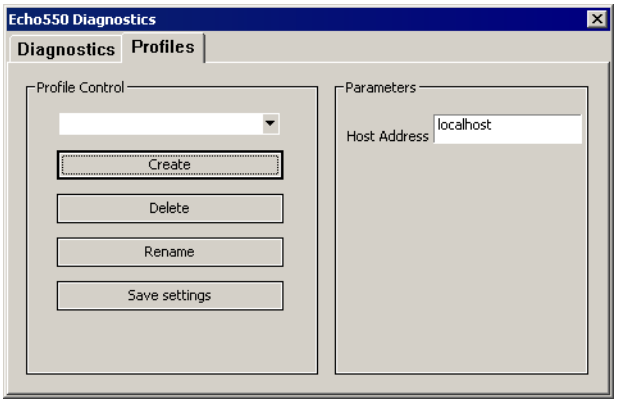
Before you start

Before you can create a profile for the Echo 550, you need to add the Labcyte Echo 550, Echo 550 source stage, and Echo 550 destination stage to the device manager.

Procedure

To create an Echo 550 profile:

1. Open **Echo 550 Diagnostics**.
2. Click the **Profiles** tab.



3. In the **Profile Control** group box, click **Create**.
4. In the **New Profile** dialog box, enter a name for the profile and click **OK**.

   Note: The name of the **Host Address** should be the IP address of the Echo 550 computer.
5. The name appears in the **Profile Control** list box.

Related information

For information about...	See...
Opening Echo 550 Diagnostics	"Opening diagnostics software" on page 105
The next step	"Setting the Echo 550 device properties" on page 400
The workflow this procedure belongs to	"Workflow for configuring Echo 550 devices" on page 398
Setting up devices	"Workflow for setting up devices" on page 106
Setting Echo 550 task parameters	"Setting Echo 550 task parameters" on page 404
Using Echo 550 Diagnostics	"Using Echo 550 Diagnostics" on page 408

Setting the Echo 550 device properties

About this topic

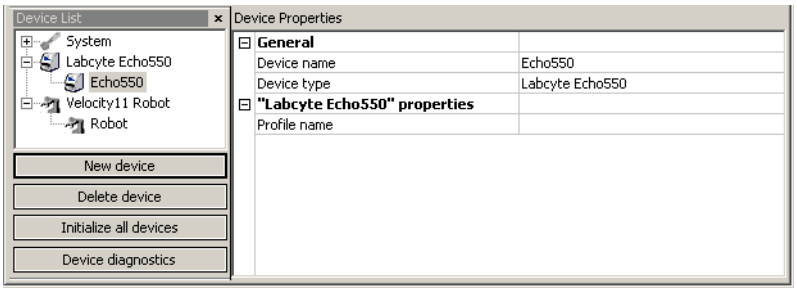
This topic describes how to set the device properties for the Echo 550 parent device.

The device properties provide VWorks with additional information about the Echo 550's current configuration. The device property settings are stored in the device file.

Procedure

To set the Echo 550 device properties:

1. Open the Echo 550 **Device Properties** page.
2. Set Echo 550's generic properties.
3. Expand the **Labcyte Echo 550 properties** group.



4. If not already selected, double-click in the field next to **Profile name.**

5. Choose a profile from the list box.
6. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
Opening Echo 550's device properties page	"Adding devices" on page 107
Setting generic properties	"Setting the generic properties for a device" on page 112
The next step	"Setting the Echo 550 source stage device properties" on page 402
The workflow this procedure belongs to	"Workflow for configuring Echo 550 devices" on page 398
Setting up devices	"Workflow for setting up devices" on page 106
Setting Echo 550 task parameters	"Setting Echo 550 task parameters" on page 404
Using Echo 550 Diagnostics	"Using Echo 550 Diagnostics" on page 408

Setting the Echo 550 source stage device properties

About this topic

This topic describes how to set the device properties for the source stage.

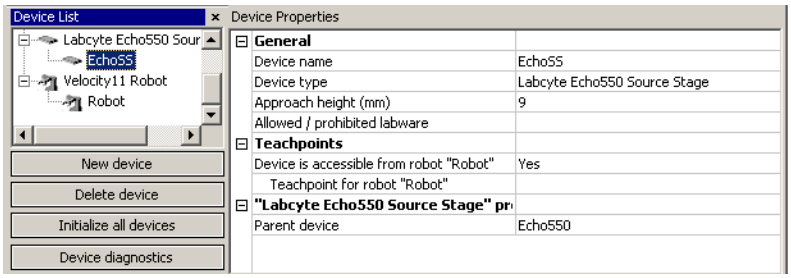
When setting up the Echo 550 in VWorks, you need to configure the source and destination locations on the device.

The source stage is the location from which liquids are aspirated.

Procedure

To set the Echo 550 source stage device properties:

1. Open the Echo 550 **Device Properties** page.
2. Set the Echo 550 source stage's generic properties.



3. Expand the **Labcyte Echo 550 Source Stage properties** group.
4. Select the parent to the source stage:
   a. Double-click in the field next to **Parent device**.
   b. Select the correct Echo 550 from the list.
5. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The next step	"Setting the Echo 550 destination stage device properties" on page 403
The workflow this procedure belongs to	"Workflow for configuring Echo 550 devices" on page 398
Opening Echo 550 source stage's device properties page	"Adding devices" on page 107
Setting up devices	"Workflow for setting up devices" on page 106
Setting Echo 550 source stage's generic properties	"Setting the generic properties for a device" on page 112
Setting Echo 550 task parameters	"Setting Echo 550 task parameters" on page 404
Using Echo 550 Diagnostics	"Using Echo 550 Diagnostics" on page 408

Setting the Echo 550 destination stage device properties

About this topic

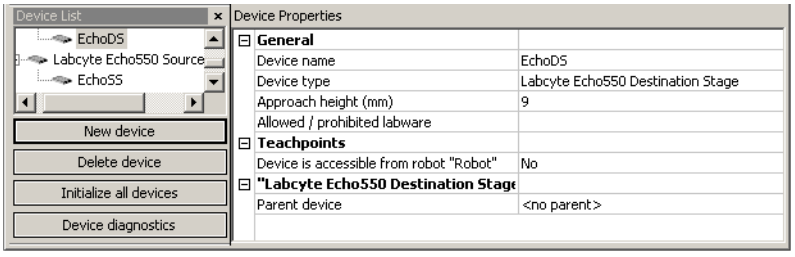
This topic describes how to set the device properties for the Echo 550 destination stage.

This is where liquids are dispensed.

Procedure

To set the Echo 550 destination stage device properties:

1. Open the Echo 550 **Device Properties** page.
2. Set the Echo 550 destination stage's generic properties.



3. Expand the **Labcyte Echo 550 Destination Stage properties** group.

4. Select the parent to the destination stage:
   a. Double-click in the field next to **Parent device.**
   b. Select the correct Echo 550 from the list.
5. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this procedure belongs to	"Workflow for configuring Echo 550 devices" on page 398
Setting up devices	"Workflow for setting up devices" on page 106
Opening the device properties page	"Adding devices" on page 107
Setting the generic properties	"Setting the generic properties for a device" on page 112
Setting Echo 550 task parameters	"Setting Echo 550 task parameters" on page 404
Using Echo 550 Diagnostics	"Using Echo 550 Diagnostics" on page 408

Setting Echo 550 task parameters

About this topic

This topic describes how to set the Echo 550 task parameters in VWorks. It uses an example to explain how to set up a VWorks protocol for an Echo 550 transfer. The VWorks protocol requires that an Echo 550 protocol has already been created. For information about setting up an Echo 550 protocol, see the Echo 550 user documents.

Echo 550 task defined

Echo 550 tasks can be used to:

- ❑ Transfer a plate to the Echo 550 and initiate an Echo 550 protocol.

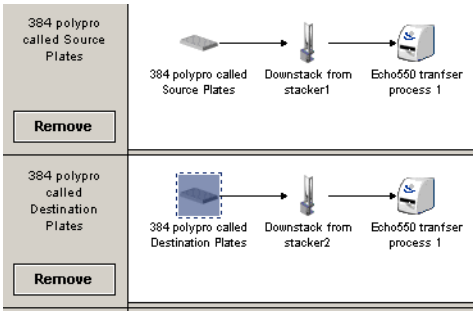
  In the Protocol Tasks list, this task is labeled Echo 550.
- ❑ Query a plate for volume determination and save the information.

  In the Protocol Tasks list, this task icon is labeled Echo 550 Audit.

Transfer task

Pairs of Echo 550 tasks are used to move plates to an Echo 550 compound reformatter and initiate an Echo 550 protocol. The Echo 550 protocol uses an acoustic wave to transfer a droplet of liquid from one plate to another.

To perform a droplet transfer with an Echo 550 you need to set up two processes in a single protocol. One process is for the source plate and the other is for the destination plate. An example protocol is shown below in which first process is for the source plate.



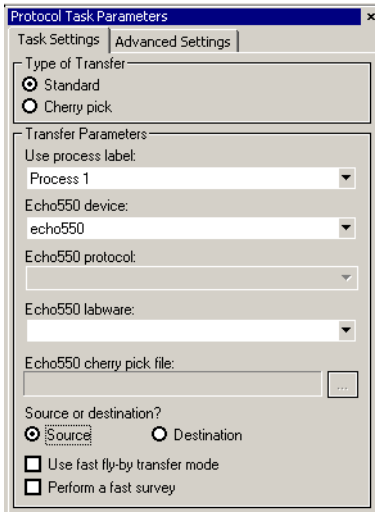
Before you start

Before you start, you must have created a protocol in the software that runs the Echo 550. For information about setting up an Echo 550 protocol, see the Echo 550 user documents.

Procedure

To perform an Echo 550 transfer:

1. Set up the VWorks protocol with processes similar to those shown in the previous section.
2. Configure the Echo 550 task for the source plate:



   a. Select the **Source** option.
   b. Select **Standard** as the **Type of Transfer**.

c. If the protocol will be performing more than one transfer, select the name of the transfer in the **Use process label** list box.

   Process 1 is the name of the default transfer.

d. If you have more than one Echo 550 on your lab automation system, select the one you want to use in the **Echo 550 device** list box.

e. In the **Echo 550 protocol** list box, select the name of the Echo 550 protocol that you want to run.

f. Select the labware type that you want to use for the source plates in the **Echo 550 labware** list box.

   Note: The labware definition you are selecting is an Echo 550 definition and not a Velocity11 labware database definition.

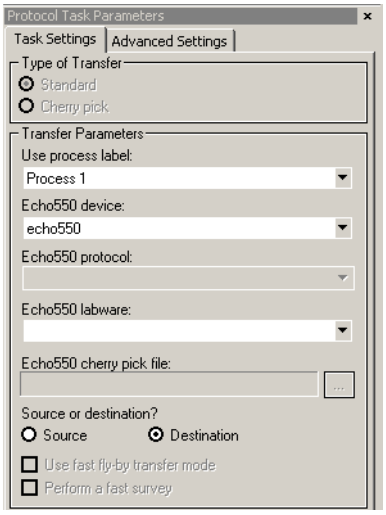
g. If you want the stage to stop at every well as it performs the transfer, clear the **Use fast fly-by transfer mode** check box.

   The default alternative is a single "scan" of every row of the plate.

h. If you want to survey a random sample of wells instead of every well, select the **Perform a fast survey** check box.

   A well survey records reflection amplitudes from the microplate and fluid surfaces, the results of which are use to optimize the delivered acoustic transfer wave.

3. Configure the Echo 550 task for the destination plates:



a. Select the **Destination** option.

b. Make sure that the name in the **Use process label** list box is the same as that used for the source plates.

c. Make sure that the name in the **Echo 550 device** list box is the same as that used for the source plates.

Audit task

The audit task is used in a single process to determine the volume of each well in a plate.

To use the audit task:

1. Select the **Source** option.
2. Select **Cherry pick** as the **Type of Transfer**.
3. Make sure that the name in the **Use process label** list box is the same as that used for the source plates.
4. Make sure that the name in the **Echo 550 device** list box is the same as that used for the source plates.
5. Click the ellipsis button (...) and choose the folder to which you want to save the .csv data file.

Procedure

To set the Echo 550 Audit task parameters:

1. Drag the **Echo 550 Audit** task to the desired location in the protocol process.
2. In the **Task Parameters** toolbar, select the Echo 550 you want to use from the **Echo 550 device** list.
3. Select the labware you are using from the **Echo 550 Labware** list.

   Note: The labware definition you are selecting is an Echo 550 definition and not a Velocity11 labware database definition.

Related information

For information about...	See...
Configuring the Echo 550	“Workflow for configuring Echo 550 devices” on page 398
Adding a device to the device manager	“Adding devices” on page 107
Using Echo 550 Diagnostics	“Using Echo 550 Diagnostics” on page 408

Using Echo 550 Diagnostics

About this topic

This topic describes how to use the Echo 550 diagnostic software to:

- ❑ Perform a manual transfer
- ❑ Manage profiles

Procedures

To perform a manual transfer:

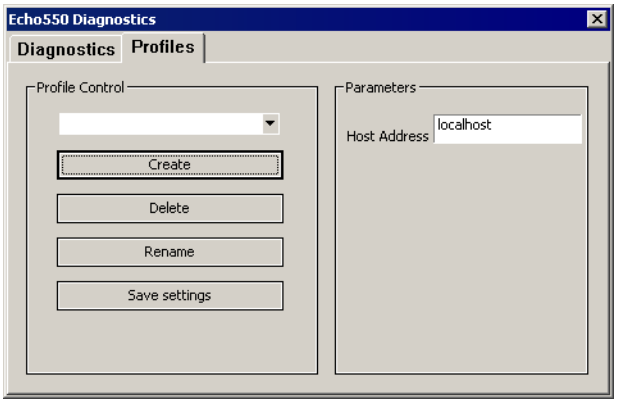
1. Open the Echo 550 Diagnostics.
2. Place a source plate on the Echo 550.
   a. Select an Echo 550 plate definition from the **Source plate definition** list box.
   b. Click **Extend source stage**.
   c. Place a plate on the stage that matches the selected definition.
   d. Click **Retract source stage**.
3. Place a destination plate on the Echo 550.
   a. Select an Echo 550 plate definition from the **Destination plate definition** list box.
   b. Click **Extend destination stage**.
   c. Place a plate on the stage that matches the selected definition.
   d. Click **Retract destination stage**.
4. Select an existing protocol from the **Transfer protocol** list box.
5. Optionally, select one or both of the following options:

Option	Comments
High-speed transfer	The stage "scans" across the plate and does not stop moving. The alternative is for it to stop at each well.
Fast survey	A survey is performed before a run, in which a sample of wells are analyzed.

6. Click **Execute transfer protocol**.

To manage Echo 550 profiles:

1. Open Echo 550 Diagnostics.
2. Click the **Profiles** tab.



3. Select a profile from the list box in the **Profile Control** group box.
   a. To delete the profile, click **Delete** and then click **Yes** in the alert message dialog box.
   b. Click **Rename** to save the profile with a different name. Enter the new name in the profile name dialog box and click **OK**.
   c. To edit the selected profile, make the desired changes and click **Save settings**.
4. Click **OK** to close the dialog box.

Related information

For information about...	See...
Opening Echo 550 Diagnostics	“Opening diagnostics software” on page 105
Configuring the Echo 550	“Workflow for configuring Echo 550 devices” on page 398
Setting up devices	“Workflow for setting up devices” on page 106
Setting Echo 550 task parameters	“Setting Echo 550 task parameters” on page 404

Envision: setting up and using

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This chapter is for people with Administrator or Technician privileges.

The PerkinElmer Envision is a plate reader that can be integrated into your lab automation system that is run using VWorks.

This chapter describes how to configure the Envision, set the Envision task parameters, and use Envision Diagnostics.

Workflow for configuring the Envision

About this topic

This topic presents the workflow for configuring the Envision in VWorks.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating an Envision profile" on page 413
3.	"Setting the generic properties for a device" on page 112
4.	"Setting the Envision device properties" on page 415

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Setting Envision task parameters	"Setting Envision task parameters" on page 416
Using Envision Diagnostics	"Using Envision Diagnostics" on page 417

Creating an Envision profile

About this topic

This topic describes how to create a profile for the Envision in VWorks.

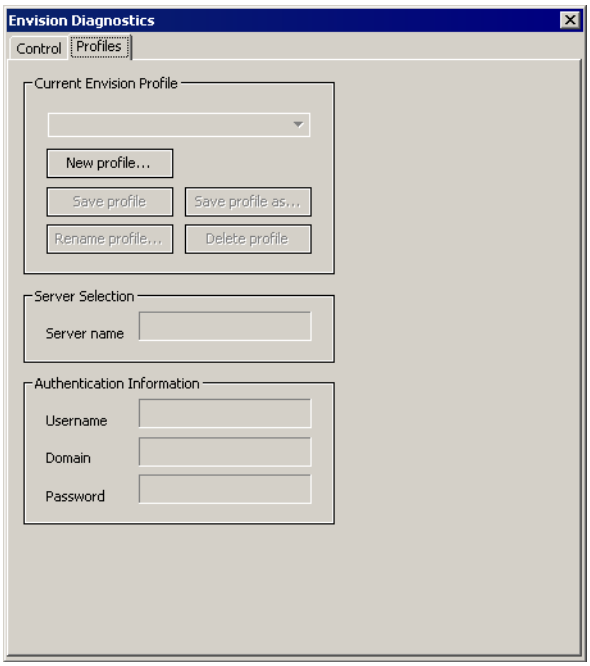
Before you start

Before you can create an Envision profile, you need to add the Envision device to the device manager.

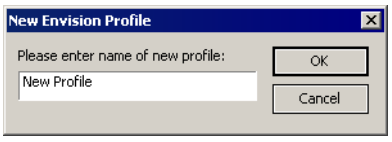
Procedures

To create an Envision profile:

1. Open **Envision Diagnostics**.
2. Click the **Profile** tab.

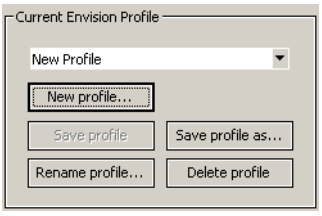


3. Click **New profile**.



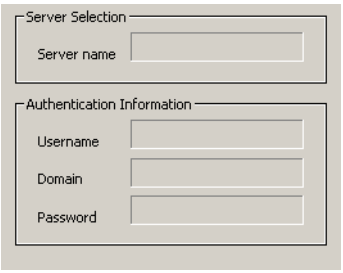
4. In the **New Envision Profile** dialog box, type the name for the profile and click **OK**.

   The name appears in the **Current Envision Profile** list box.



To set the profile attributes:

1. Select the name of the Envision device profile that you want to edit or modify in the **Current Envision Profile** list box.
2. Enter the name of the computer that controls the Envision device into the **Server name** field.
3. In the **Authentication Information** group box, enter the username, name of the domain, and the password for the user account on the Envision's computer that you want to use.



4. Click **Save profile**.

Related information

For information about...	See...
The next step	Setting the generic properties for a device
The workflow this procedure belongs to	"Workflow for configuring the Envision" on page 412
Adding a device to the device manager	"Adding devices" on page 107
Opening Envision Diagnostics	"Opening diagnostics software" on page 105
Setting Envision task parameters	"Setting Envision task parameters" on page 416
Using Envision Diagnostics	"Using Envision Diagnostics" on page 417

Setting the Envision device properties

About this topic

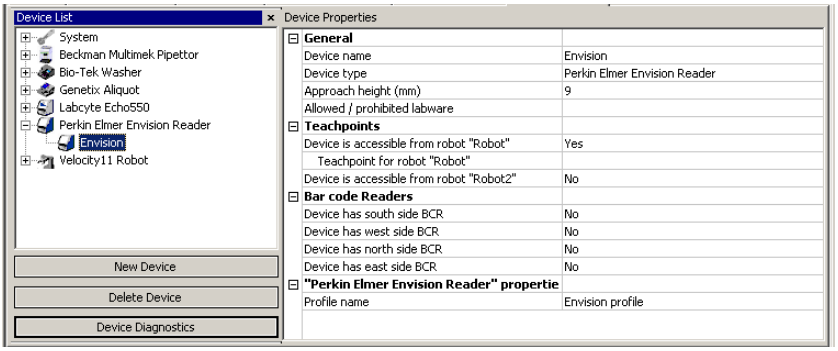
This topic describes how to set the Envision device properties.

The device properties provides VWorks with additional information about the Envision's current configuration. The device property settings are stored in the device file.

Procedure

To set the Envision device properties:

1. Open the **Device Properties** page.
2. Set the Envision generic device properties.



3. Expand the **Perkin Elmer Envision Reader properties** group.
4. If not already selected, double-click in the field adjacent to **Profile name** and choose a profile from the list box.
5. Save the **Device Properties** settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
Setting Envision generic device properties	"Setting the generic properties for a device" on page 112
The workflow this procedure belongs to	"Workflow for configuring the Envision" on page 412
Adding a device to the device manager	"Adding devices" on page 107
Opening Envision device properties page	"Adding devices" on page 107
Setting Envision task parameters	"Setting Envision task parameters" on page 416
Using Envision Diagnostics	"Using Envision Diagnostics" on page 417

Setting Envision task parameters

About this topic

This topic describes how to set the Envision device task parameters in VWorks.

Envision task defined

The Envision task moves a plate to a PerkinElmer Envision plate reader and instructs the reader to perform an Envision assay protocol.

Envision assay protocols are created using the Envision's dedicated computer and software. The protocol to use for the task is a setting of the Envision task.

Procedure

To set Envision task parameters:

1. Add the Envision task to the desired place in the protocol process.
2. In the **Protocol Task Parameters** toolbar, check the name of the currently selected assay protocol, which is displayed in the **Assay protocol to run** box.
3. If the displayed protocol is not the one you want to run, click **Select new assay protocol** and select the profile from the **Select Envision Assay Protocol** list box.
4. Click **OK**.

Related information

For information about...	See...
Configuring the Envision	“Workflow for configuring the Envision” on page 412
Adding a device to the device manager	“Adding devices” on page 107
Adding tasks to protocols	“Adding a task or pipette task” on page 168
Using Envision Diagnostics	“Using Envision Diagnostics” on page 417

Using Envision Diagnostics

About this topic

This topic describes how to:

- ❑ Manage profiles
- ❑ Initialize a profile
- ❑ Move plates in to and out of the reader
- ❑ Run Envision protocols on the reader

Procedures

To manage profiles:

1. Open **Envision Diagnostics**.
2. Click the **Profiles** tab.
3. Select a profile from the list box in the **Current Envision Profile** group box.
   a. To delete the profile, click **Delete profile** and then click **Yes** in the **alert message** dialog box.
   b. To rename the profile, click **Rename profile**.
   c. Enter the new name in the **profile name** dialog box and click **OK**.
   d. To edit the selected profile, make the desired changes and click **Save profile**.
   e. To create a new profile with the same settings, click **Save profile as**, enter a name in the **Save Profile As** dialog box and click **OK**.
4. Click **OK** to close the dialog box.

To initialize an Envision profile:

1. Open the **Envision Diagnostics**.
2. Select the profile you want to use from the **Current Envision Profile** list and click **Open profile**.

To manually load and unload plates:

1. Open **Envision Diagnostics**.
2. Click the **Control** tab, if it is not displayed.
3. In the **Current Envision Profile** group box, select the profile you want to use.
4. Click **Open profile**.
5. Click **Load plate** or **Unload plate**.

   The plate is loaded into the Envision or unloaded from the Envision.

Note: Envision protocols are created on the Envision's own computer. After creation, the name of the protocol appears in the **Envision Functions** list box of the diagnostics software.

To run an Envision protocol:

1. Open **Envision Diagnostics**.
2. Click the **Control** tab.
3. In the **Current Envision Profile** group box, select the profile you want to use.
4. Click **Open profile**.
5. From the **Envision Functions** list box, select the protocol that you want to run.
6. Click **Run protocol**.

   If there is a plate on the plate stage, the plate is loaded. The protocol runs.

Related information

For information about...	See...
Configuring the Envision	"Workflow for configuring the Envision" on page 412
Adding a device to the device manager	"Adding devices" on page 107
Opening Envision Diagnostics	"Opening diagnostics software" on page 105
Setting Envision task parameters	"Setting Envision task parameters" on page 416
Creating an Envision profile	"Creating an Envision profile" on page 413

FlexiSpense: setting up and using 20

This chapter is for people with Administrator or Technician privileges.

The FlexiSpense is a liquid dispenser for 96- and 384-well microplates that can be integrated into a lab automation system using VWorks.

This chapter describes how to configure the FlexiSpense, set the FlexiSpense task parameters and use FlexiSpense Diagnostics.

Workflow for configuring the FlexiSpense

About this topic

This topic gives the workflow for configuring the FlexiSpense.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Setting the generic properties for a device" on page 112
3.	"Setting the FlexiSpense device properties" on page 421

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Setting FlexiSpense task parameters	"Setting FlexiSpense task parameters" on page 422
Using FlexiSpense Diagnostics	"Using FlexiSpense Diagnostics" on page 424

Setting the FlexiSpense device properties

About this topic

This topic describes how to set the FlexiSpense device properties.

The device properties provides VWorks with additional information about the FlexiSpense's current configuration. The device property settings are stored in the device file.

Before you start

Before you can set the FlexiSpense device properties, you need to add the FlexiSpense device to the device manager.

Procedure

To set the FlexiSpense device properties:

1. Open the **Device Properties** page.
2. Set the generic properties.
3. Expand the **Flexispense properties** group.
4. Double-click in the field adjacent to **COM port**.
5. Select the computer's serial COM port to which the FlexiSpense is connected.
6. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this procedure belongs to	"Workflow for configuring the FlexiSpense" on page 420
Adding a device to the device manager	"Adding devices" on page 107
Opening the Device Properties page	"Adding devices" on page 107
Setting generic properties	"Setting the generic properties for a device" on page 112
Setting FlexiSpense task parameters	"Setting FlexiSpense task parameters" on page 422
Using FlexiSpense Diagnostics	"Using FlexiSpense Diagnostics" on page 424

Setting FlexiSpense task parameters

About this topic

This topic describes how to set the FlexiSpense task parameters in VWorks.

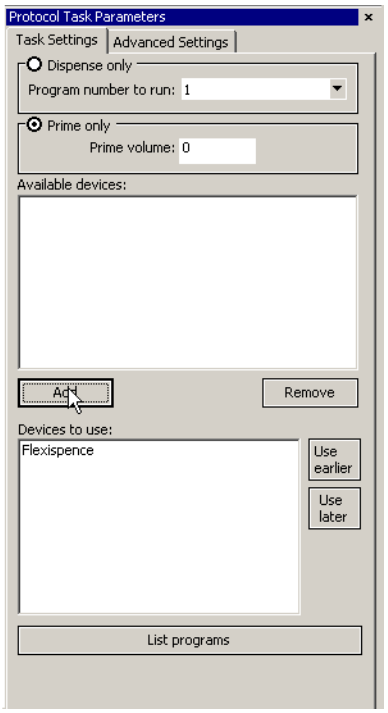
FlexiSpense task defined

The Flexispense task moves a plate to the FlexiSpense where a dispensing process is initiated.

Procedure

To set the FlexiSpense task parameters:

1. Add a **FlexiSpense** task to a protocol process.



2. Choose an operation:

   Note: The prime function is for pre-protocol processes and the dispense function for Protocol processes.

   a. If you select **Dispense only**, select the program you want to run from the **Program number to run** list box.

      Programs can be composed and then stored using the FlexiSpense device itself. These programs can also be changed and created using VWorks.

      To edit or create a program, click **List programs** and then click the **Processes** tab to open the **Flexispense diagnostics** dialog box.

   b. If you select **Prime only**, enter the volume (in microliters) with which you want to prime. In the **Task Settings** page of the

Protocol Task Parameters toolbar, select the desired FlexiSpense from the **Available devices** list and click **Add**.

The device name appears in the **Devices to use** list.

3. If you have added more than one FlexiSpense, you can change the order in which a particular FlexiSpense is used.
   a. Select a FlexiSpense in the **Devices to use** list.
   b. Click **Use earlier** to increase the priority of the FlexiSpense or **Use later** to decrease its priority.

Related information

For information about...	See...
Configuring the FlexiSpense	"Workflow for configuring the FlexiSpense" on page 420
Adding tasks to protocols	"Adding a task or pipette task" on page 168
Adding a device to the device manager	"Adding devices" on page 107
Using FlexiSpense Diagnostics	"Using FlexiSpense Diagnostics" on page 424

Using FlexiSpense Diagnostics

About this topic

This topic describes how to:

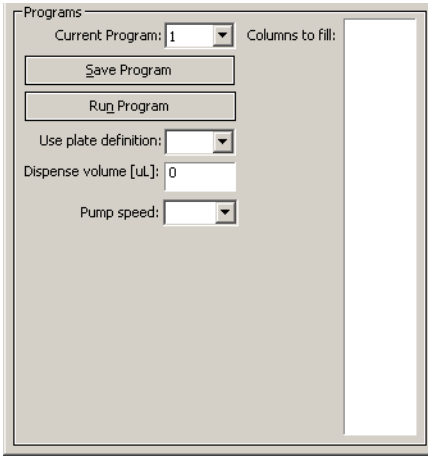
- ❑ Modify dispense programs
- ❑ Define plate types
- ❑ Manually control the pump and reset the device

For more information about using the FlexiSpense, see the FlexiSpense user documentation.

Procedures

To modify dispense programs:

1. Open **Flexispense Diagnostics**.

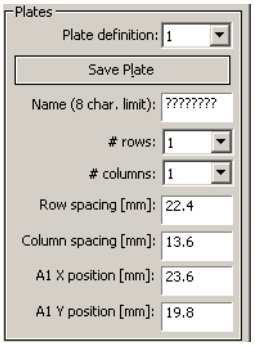


2. Select the program you want to modify from the **Current Program** list box.

   The settings for that program will load into the dialog box.
3. Select the desired plate type from the **Use plate definition** list box.
4. Enter the volume to dispense (in microliters) in the **Dispense volume** field.
5. Select a pump speed from the **Pump speed** list box.
6. Click **Save Program**.
7. To do a test run, place a plate on the FlexiSpense and click **Run Program**.
8. Click **OK** to save changes and close the dialog box.

To define a plate type:

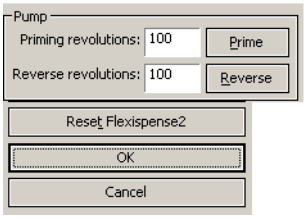
1. Open the **Flexispense Diagnostics**.



2. From the **Plate definition** list box located in the **Plates** group box, select the plate number you want to define.
3. Enter a name for the plate in the **Name** field.
4. Define the well number:
   a. From the **#rows** list box, select the total number of rows (horizontal axis) in your plate.
   b. From the **#columns** list box, select the total number of columns (vertical axis) in your plate.
5. Enter the rest of the plate measurements in the appropriate fields.
6. Click **Save Plate** to save the definitions.
7. Click **OK** to close the dialog box.

To manually control the pump and reset the Flexispense:

1. Open the **Flexispense Diagnostics**.



2. To operate the pump in the forward direction, enter the number of revolutions you want the pump to turn in the **Priming revolutions** field, and click **Prime**.
3. To operate the pump in the backward direction, enter the number of revolutions in reverse you want the pump to turn in the **Reverse revolutions** field, and click **Reverse**.
4. To reset the FlexiSpense, click **Reset Flexispense2**. This command is typically used for troubleshooting purposes or when communication has been interrupted.

Related information

For information about...	See...
Definitions of plate dimensions	*FlexiSpense User Guide*
Configuring a FlexiSpense	"Workflow for configuring the FlexiSpense" on page 420
Adding a device to the device manager	"Adding devices" on page 107
Opening FlexiSpence Diagnostics	"Opening diagnostics software" on page 105
Opening device properties page	"Adding devices" on page 107
Setting generic properties	"Setting the generic properties for a device" on page 112
Setting FlexiSpense task parameters	"Setting FlexiSpense task parameters" on page 422

FlexiSpense-M: setting up and using 21

This chapter is for people with Administrator or Technician privileges.

The FlexiSpense-M is a liquid dispenser for 96- and 384-well microplates that can be integrated into a lab automation system run using VWorks.

This chapter describes how to configure the FlexiSpense-M, to set the FlexiSpense-M task parameters, and use FlexiSpense-M Diagnostics.

Workflow for configuring the FlexiSpense-M

About this topic

This topic presents the workflow for configuring the FlexiSpense-M in VWorks.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating a FlexiSpense-M profile" on page 429
3.	"Setting the generic properties for a device" on page 112
4.	"Setting the FlexiSpense-M device properties" on page 430

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Setting FlexiSpense-M task parameters	"Setting FlexiSpense-M task parameters" on page 431
Using FlexiSpense-M Diagnostics	"Using Flexispense-M Diagnostics" on page 433

Creating a FlexiSpense-M profile

About this topic

This topic describes how to create a FlexiSpense-M profile.

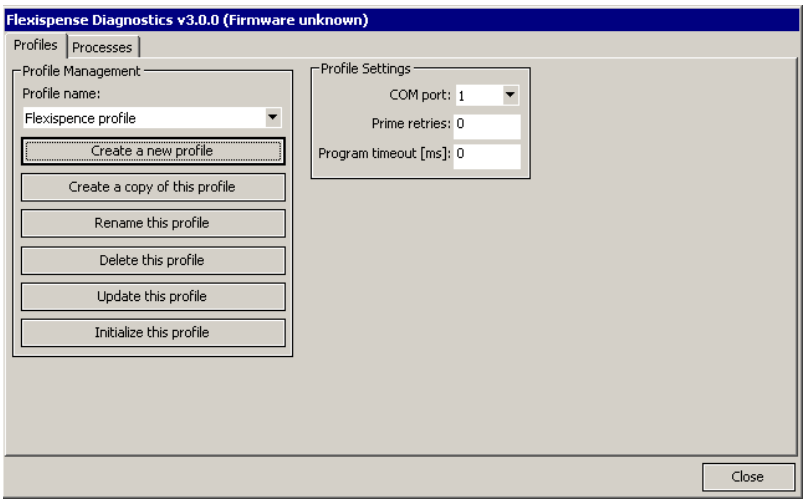
Before you start

Before you can create a profile, you need to add the FlexiSpense-M to the device manager.

Procedure

To create a FlexiSpense-M profile:

1. Open **Flexispence Diagnostics**.



2. Click **Create a new profile**, enter a name for the device in the **Create Profile** dialog box and click **OK**.
3. Choose the **Profile Settings**:
   a. From the **COM port** list box, select the port that the FlexiSpense-M uses to connect to the computer running VWorks.
   b. Enter the number of times to attempt priming, before displaying an error message, in the **Primer retries** field.
   c. Enter the amount of time (in milliseconds) the software should wait for a response from the device, before an error message is displayed, in the **Program timeout (ms)** field.
4. Click **Update this profile**.
5. Click **Close**.

Related information

For information about...	See...
The next step	"Setting the generic properties for a device" on page 112
The workflow this procedure belongs to	"Workflow for configuring the FlexiSpense-M" on page 428
Opening FlexiSpence Diagnostics	"Opening diagnostics software" on page 105
Adding a device to the device manager	"Adding devices" on page 107
Setting FlexiSpense-M task parameters	"Setting FlexiSpense-M task parameters" on page 431
Using FlexiSpense-M Diagnostics	"Using Flexispense-M Diagnostics" on page 433

Setting the FlexiSpense-M device properties

About this topic

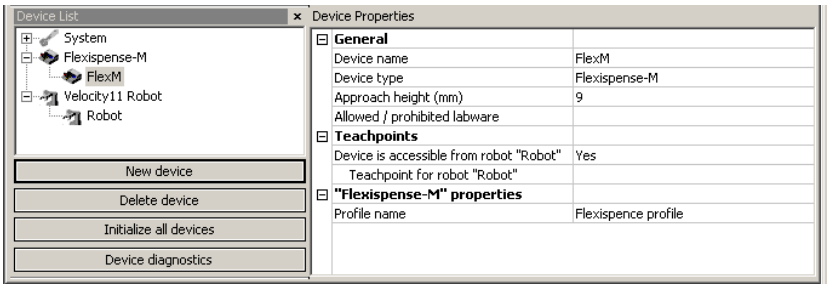
This topic describes how to set the FlexiSpense-M device properties.

The device properties provides VWorks with additional information about the FlexiSpense's current configuration. The device property settings are stored in the device file.

Procedure

To set the FlexiSpense-M device properties:

1. Open the **Device Properties** page.
2. Set the FlexiSpence-M generic device properties.



3. Expand the **Flexispence-M properties** group.
4. If not already selected, double-click in the field adjacent to **Profile name** and select the FlexiSpense-M profile from the list box.
5. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this procedure belongs to	"Workflow for configuring the FlexiSpense-M" on page 428
Adding a device to the device manager	"Adding devices" on page 107
Opening FlexiSpence-M device properties page	"Adding devices" on page 107
Setting FlexiSpense generic device properties	Setting the generic properties for a device
Setting FlexiSpense-M task parameters	"Setting FlexiSpense-M task parameters" on page 431
Using FlexiSpense-M Diagnostics	"Using Flexispense-M Diagnostics" on page 433

Setting FlexiSpense-M task parameters

About this topic

This topic describes how to set the FlexiSpense-M task parameters.

FlexiSpense-M task defined

The FlexiSpense-M task moves a plate to the FlexiSpense device where a dispense is initiated.

Procedure

To set the FlexiSpense-M task parameters:

1. Add the **Flexispense** task to a protocol process.
2. In the **Task Settings** page of the **Protocol Task Parameters** toolbar, choose an operation:

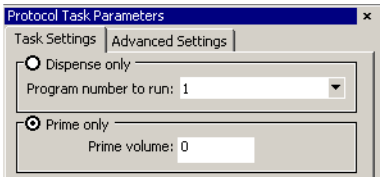
   Note: The prime function is for pre-protocol processes and the dispense function for protocol processes.

   a. If you select **Dispense only**, select the program you want to run from the **Program number to run** list box.

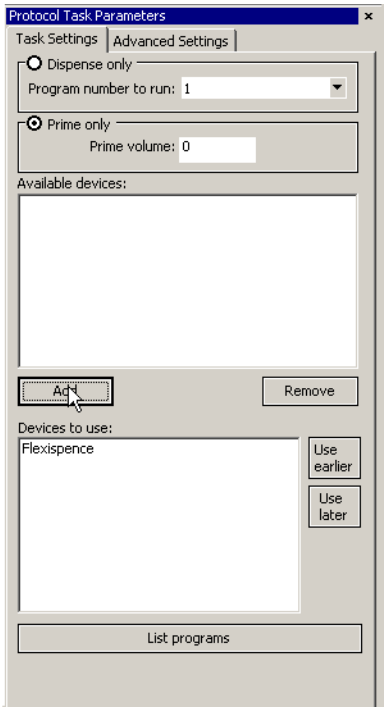
      Programs can be composed and then stored using the FlexiSpense-M device itself. These programs can also be changed and created using VWorks software.

      To edit or create a program, click **List programs** to open the **Flexispense Diagnostics** dialog box.

   b. If you select **Prime only**, enter the volume (in microliters) with which you want to prime.



3. Select the FlexiSpense-M device that you want to use:
   a. Select the desired FlexiSpense-M from the **Available devices** list.
   b. Click **Add** and the device name appears in the **Devices to use** list.



4. If you have added more than one FlexiSpense-M, you can change the order in which a particular FlexiSpense-M is used.
   a. Select a FlexiSpense-M in the **Devices to use** list.
   b. Click **Use earlier** to increase the priority of the FlexiSpense-M or **Use later** to decrease its priority.

Related information

For information about...	See...
The workflow this procedure belongs to	"Workflow for configuring the FlexiSpense-M" on page 428
Adding a device to the device manager	"Adding devices" on page 107
Adding tasks to protocols	"Adding a task or pipette task" on page 168
Using FlexiSpense-M Diagnostics	"Using Flexispense-M Diagnostics" on page 433

Using Flexispense-M Diagnostics

About this topic

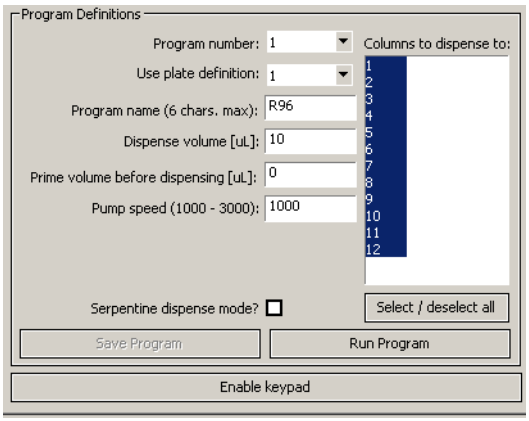
This topic describes how to use FlexiSpense-M Diagnostics to:

- ❑ Modify dispense programs
- ❑ View plate definitions
- ❑ Manually control the pump

To modify a dispense program

To modify dispense programs:

1. Open the **Flexispense-M Diagnostics.**



2. Select the program you want to modify from the **Program number** list box.

   The settings for that program will load into the dialog box.
3. Select the desired plate type from the **Use plate definition** list box.
4. Optionally, edit the **Program name**.

5. Edit the volume to dispense (in microliters) in the **Dispense volume** field.
6. Edit the prime volume before dispensing.
7. Select a pump speed from the **Pump speed** list box.
8. Click **Save Program**.
9. To do a test run, place a plate on the Flexispense and click **Run Program**.
10. Click **OK** to save changes and close the dialog box.

Viewing plate definitions

To view plate definitions:

1. Open the **Flexispense-M Diagnostics**.

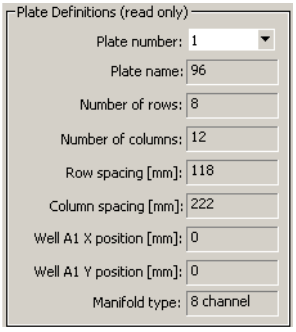


Plate Definitions (read only)
Plate number: 1
Plate name: 96
Number of rows: 8
Number of columns: 12
Row spacing [mm]: 118
Column spacing [mm]: 222
Well A1 X position [mm]: 0
Well A1 Y position [mm]: 0
Manifold type: 8 channel

2. Select a plate number from the **Plate number** list box located in the **Plate Definitions (read only)** group box.

   The values for the selected plate loads.
3. Click **OK** to close the dialog box.

Priming the device

To prime the FlexiSpense-M:

1. Open the **Flexispense-M Diagnostics**.

2. Enter the volume (in microliters) for each prime.
3. Click **Prime**.

Related information

For information about...	See...
The workflow this procedure belongs to	"Workflow for configuring the FlexiSpense-M" on page 428
Opening FlexiSpense-M Diagnostics	Opening diagnostics software
Adding a device to the device manager	"Adding devices" on page 107
Setting FlexiSpense-M task parameters	"Setting FlexiSpense-M task parameters" on page 431

Multidrop: setting up and using

22

This chapter is for people with Administrator or Technician privileges.

The Thermo Labsystems Multidrop is a 96- or 384-well dispenser capable of dispensing up to eight different liquids into one plate. It can be integrated into a lab automation system that is run using VWorks.

This chapter describes how to configure the Multidrop, set the Multidrop task parameters, and use Multidrop Diagnostics.

Workflow for configuring the Multidrop

About this topic

This topic presents the workflow for configuring the Multidrop.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating a Multidrop profile" on page 439
3.	"Setting the generic properties for a device" on page 112
4.	"Setting the Multidrop device properties" on page 440

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Setting Multidrop task parameters	"Setting MultiDrop task parameters" on page 441
Using Multidrop Diagnostics	"Using Multidrop Diagnostics" on page 443

Creating a Multidrop profile

About this topic

This topic describes how to set up a profile for a Multidrop in VWorks software.

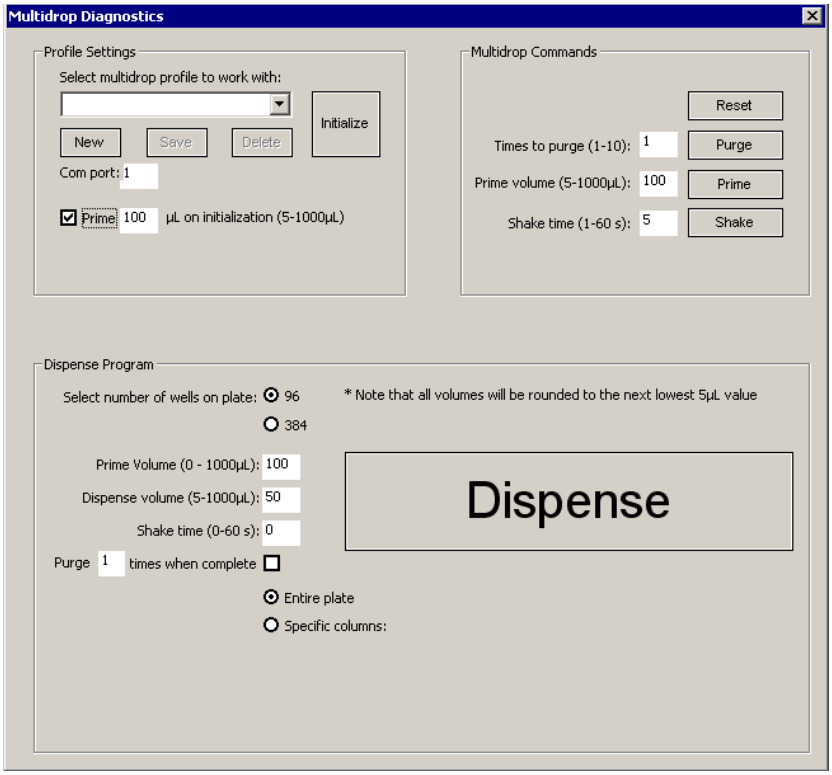
Before you start

Before you can create a profile, you will need to add the Multidrop to the device manager.

Procedure

To create a Multidrop profile:

1. Open **Multidrop Diagnostics**.



2. In the **Profile Settings** group box, click **New**.
3. Enter a name in the **New Multidrop Profile** dialog box and click **OK**.
4. In the **Com port** text field, enter the number of the COM port you are using to connect the Multidrop with the computer running VWorks.
5. If you want the Multidrop to prime whenever it is initialized, select the **Prime** check box and enter the volume to prime in the text field.
6. Click **Save**.

Related information

For information about...	See...
Profiles	"About profiles" on page 103
The next step	"Setting the Multidrop device properties" on page 440
The workflow this procedure belongs to	"Workflow for configuring the Multidrop" on page 438
Adding the Multidrop to the device manager	"Adding devices" on page 107
Opening Multidrop Diagnostics	"Opening diagnostics software" on page 105
Setting Multidrop task parameters	"Setting MultiDrop task parameters" on page 441
Using Multidrop Diagnostics	"Using Multidrop Diagnostics" on page 443

Setting the Multidrop device properties

About this topic

This topic describes how to set the Multidrop device properties.

The device properties provides VWorks with additional information about the Multidrop's current configuration. The device properties settings are stored in the device file.

Procedure

To set the Multidrop device properties:

1. Open the **Device Properties** page.
2. Set the generic properties.
3. Expand the **Multidrop properties** group.
4. If not already selected, double-click in the field adjacent to **Profile name**
5. Choose a profile from the list box.
6. Save the **Device Properties** settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this procedure belongs to	"Workflow for configuring the Multidrop" on page 438
Adding the Multidrop to the device manager	"Adding devices" on page 107
Opening Multidrop device properties page	"Adding devices" on page 107
Setting Multidrop task parameters	"Setting MultiDrop task parameters" on page 441
Using Multidrop Diagnostics	"Using Multidrop Diagnostics" on page 443

Setting MultiDrop task parameters

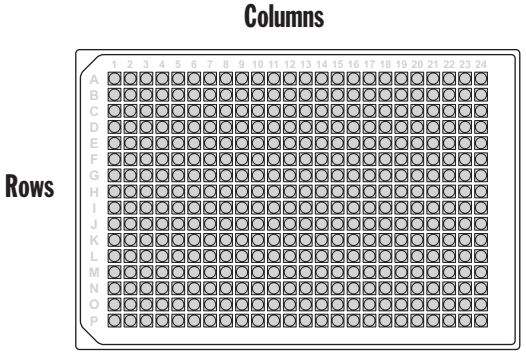
About this topic

This topic describes how to set the Multidrop task parameters.

Multidrop task defined

The Multidrop task moves a plate to a Thermo Labsystems Multidrop 384 or 96 dispenser and instructs the dispenser to fill the plate. You can specify whether to include prime, shake or purge operations.

The Multidrop is capable of dispensing up to eight different liquids into one plate. During a dispense, the plate stage moves in the left-right axis and the wells are filled in columns, starting with column 1. In a 96-well plate there are eight rows, so every well in a column is filled at the same time. In a 384-well plate there are 16 rows, requiring two dispense passes. During the first pass, every second well in a column is filled. The plate stage then moves over by one well so that the dispensers sit above empty wells. In the second pass, the stage returns to the starting position and the remaining wells are filled.



Procedure

To set Multidrop parameters:

1. Add a Multidrop task to a protocol process.
2. If VWorks has more than one Multidrop, select the one you want to use for the task from the **Select the Multidrop to work with** list box.
3. If you want to prime the Multidrop, enter the volume of liquid to prime with in the **Prime volume** text box.

   Priming moves liquid through the dispensing system into waste to make sure that there is no air in the lines.
4. In the **Dispense volume** text box, enter the volume of liquid that you want to dispense into each well.
5. To shake the plate after the dispense, enter a value into the **Shake time** text box.
6. To purge the lines after the dispense, select the **Purge x times when complete** check box, and enter the number of times to purge.

   Purging moves liquid back into the liquid reservoir or reservoirs. If you want to return all liquid, the value of *x* may need to be greater than one.
7. To dispense into all wells, make sure that the **Entire plate** option is selected.
8. To only dispense into some of the wells:
   a. Select the **Selected columns** option.
   b. Click **Select none**.
   c. In the number matrix, click the numbers corresponding to the columns to dispense into.

      In the following example liquid will be dispensed into columns 2, 4, 6 and 8 of a 384-well plate.

Related information

For information about...	See...
Configuring the Multidrop	"Workflow for configuring the Multidrop" on page 438
Adding the Multidrop to the device manager	"Adding devices" on page 107
Adding tasks to protocols	"Adding a task or pipette task" on page 168
Using Multidrop Diagnostics	"Using Multidrop Diagnostics" on page 443

Using Multidrop Diagnostics

About this topic

This topic describes how to use Multidrop Diagnostics to manage profiles and to manually operate the device one action at a time.

Managing profiles

To modify an existing profile:

1. Open the **Multidrop Diagnostics**.
2. Select the profile you want to edit from the list box in the **Profile Settings** group box.
3. Make the desired changes to the profile.
4. Click **Save**.

To delete a profile:

1. Open the **Multidrop Diagnostics**.
2. Select the profile you want to delete from the list box in the **Profile Settings** group box.
3. Click **Delete**.
4. Click **Yes** in the message alert dialog box.

Before you start

Before you operate the Multidrop, make sure it is properly initialized.

Terms defined

The Multidrop has priming and purging functions that can be controlled through Multidrop Diagnostics.

Priming

Priming moves liquid through the dispensing system into waste to make sure that there is no air in the lines.

Purging

Purging moves liquid back into the liquid cassettes.

Operating the Multidrop

To initialize the Multidrop:

1. In the **Profile Settings** group box, select the appropriate Multidrop profile from the list box.
2. If you want to prime the fluid lines when you initialize the Multidrop, select the **Prime** check box and enter the volume of liquid with which you want to prime.
3. Click **Initialize**.

To fill a plate:

1. Refer to the *Multidrop User Manual* for information about preparing to fill a plate.
2. In the **Dispense Program** group box, select the number of wells in the plate.
3. If you want to prime the Multidrop, enter the volume of liquid to prime with in the **Prime volume** text box.
4. In the **Dispense volume** text box, enter the volume of liquid that you want to dispense into each well.
5. To shake the plate after the dispense, enter a value into the **Shake time** text box.
6. To purge the lines after the dispense, select the **Purge x times when complete** check box, and enter the number of times to purge.

   If you want to return all liquid, the value of x may need to be greater than one.
7. To dispense into all wells, make sure that the **Entire plate** option is selected.
8. To only dispense into some of the wells:
   a. Select the **Selected columns** option.
   b. Click **Clear All**.
   c. In the number matrix, click the numbers corresponding to the columns to which you want to dispense.

      In the following example liquid will be dispensed into columns 2, 4, 6, and 8 of a 384-well plate.

9. Click **Dispense**.

Performing non-dispense operations

You can perform basic non-dispense operations using the buttons in the **Multidrop Commands** group box.

To purge the liquid line:

1. Enter a value in the **Times to purge** text box and click **Purge**.

   If you want to return all liquid, the value of x may need to be greater than one.

To prime the liquid lines:

1. Enter a value in the **Prime volume** text box and click **Prime**.

To shake a plate:

1. Enter a value in the **Shake time** text box and click **Shake**.

Related information

For information about...	See...
Configuring the Multidrop	“Workflow for configuring the Multidrop” on page 438
Adding a device to the device manager	“Adding devices” on page 107
Opening Multidrop Diagnostics	“Opening diagnostics software” on page 105
Setting Multidrop task parameters	“Setting MultiDrop task parameters” on page 441

Multiskan Ascent: setting up and using 23

This chapter is for people with Administrator or Technician privileges.

The Thermo Labsystems Multiskan Ascent is a 96- and 384-well microplate reader that can be integrated into a lab automation system using VWorks.

This chapter describes how to configure the Multiskan Ascent instrument, set the Multiskan Ascent task parameters, and use Multiskan Diagnostics.

Workflow for configuring the Multiskan Ascent

About this topic

This topic gives the workflow for configuring the Multiskan Ascent.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating a Multiskan Ascent profile" on page 449
3.	"Setting the generic properties for a device" on page 112
4.	"Setting the Multiskan Ascent device properties" on page 450

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Setting Multiskan task parameters	"Setting Multiskan Ascent task parameters" on page 452
Using Multiskan Diagnostics	"Using Multiskan Ascent Diagnostics" on page 454

Creating a Multiskan Ascent profile

About this topic

This topic describes how to create a profile for the Thermo Labsystems Multiskan Ascent reader in VWorks.

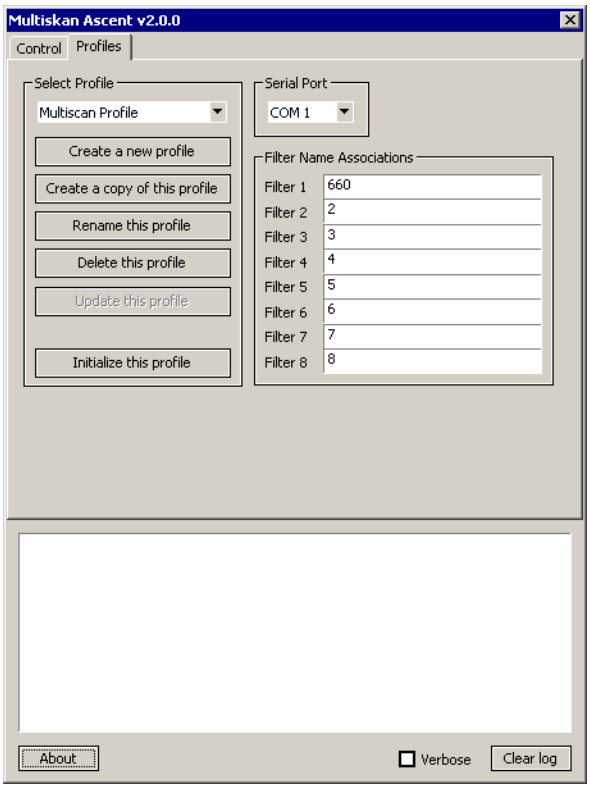
Before you start

Before you can create a Multiskan Ascent profile, you need to add the Multiskan Ascent device to the device manager.

Procedure

To create a Multiskan Ascent profile:

1. Open **Multiskan Ascent Diagnostics**.
2. Click the **Profiles** tab.



3. Click **Create a new profile** and enter a name for the file in the **New Profile** dialog box.
4. Click **OK**.
5. From the **Serial port** list box, select the COM port the you are using to connect the Multiskan Ascent to the computer running VWorks.
6. Enter filter name associations for the filters, if desired:
   a. Click in the field adjacent to a filter in the **Filter Name Associations** group box and type in a name.
   b. Click **Update this profile**.
7. Close the dialog box.

Related information

For information about...	See...
Profiles	"About protocol files" on page 162
The next step	"Setting the generic properties for a device" on page 112
Opening Multiskan Ascent Diagnostics	"Opening diagnostics software" on page 105
The workflow this procedure belongs to	"Workflow for configuring the Multiskan Ascent" on page 448
Adding a device to the device manager	"Adding devices" on page 107
Setting Multiskan task parameters	"Setting Multiskan Ascent task parameters" on page 452
Using Multiskan Diagnostics	"Using Multiskan Ascent Diagnostics" on page 454

Setting the Multiskan Ascent device properties

About this topic

This topic describes how to set the Multiskan Ascent device properties.

The device properties provides VWorks with additional information about the Multiskan's current configuration. The device property settings are stored in the device file.

Procedure

To set the Multiskan device properties:

1. Open the **Device Properties** page.
2. Set the generic device properties.
3. Expand the **Thermo Labsystems Multiskan Ascent properties** group.
4. If not already selected, double-click in the field adjacent to **Profile name.**
5. Choose a profile from the list box.
6. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this procedure belongs to	"Workflow for configuring the Multiskan Ascent" on page 448
Adding a device to the device manager	"Adding devices" on page 107
Opening Multiskan Ascent device properties	"Adding devices" on page 107
Setting Multiskan task parameters	"Setting Multiskan Ascent task parameters" on page 452
Using Multiskan Diagnostics	"Using Multiskan Ascent Diagnostics" on page 454

Setting Multiskan Ascent task parameters

About this topic

This topic describes how to set the Multiskan Ascent task parameters in the VWorks.

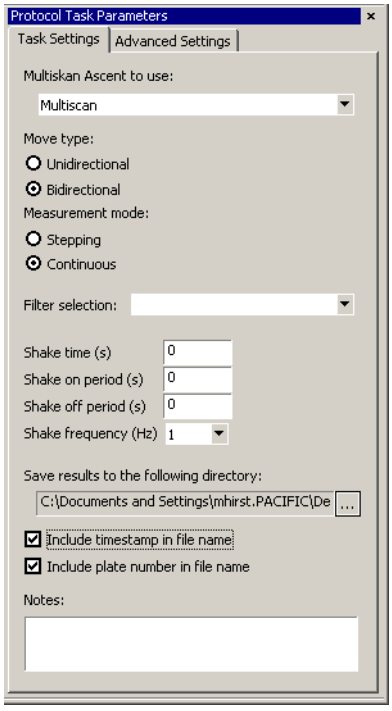
Multiskan Ascent task defined

The Multiskan task moves a plate to the Multiskan where it is read.

Procedure

To set the Multiskan Ascent task parameters:

1. Add a Multiskan Ascent task to a protocol process.



2. In the **Task Settings** page of the **Protocol Task Parameters** toolbar, select the Multiskan that you want to use from the **Multiskan Ascent to use** list box.
3. Choose a **Move type**:

Move type	Comments
Unidirectional	Each row of wells on the plate is read in the same direction, for example, left-to-right
Bidirectional	The plate rows are read in both directions, for example, left-to-right followed by right-to-left

Bidirectional plate reading is faster while unidirectional plate reading tends to be more consistent.

4. Choose a **Measurement mode**:

Move type	Comments
Stepping	The sensor stops at each well to take a reading.
Continuous	The sensor takes readings without stopping.

   Continuous measurement is faster.

5. Choose the appropriate filter from the **Filter selection** list box.

   These become available after the Multiskan is turned on and scans for filters that are present.

6. Set shaking parameters, if desired:
   a. Enter the total amount of time (in seconds) for the shake process in the **Shake time** field.
   b. Enter the amount of time (in seconds) you want to shake for each shake interval in the **Shake on period** field.
   c. Enter the amount of time (in seconds) you want to rest in between shake periods in the **Shake off period** field.
   d. Select the shaking frequency from the **Frequency (Hz)** list box.
7. Choose a folder in which to save the file containing the results:
   a. Click the ellipsis button (...) and navigate to the desired folder in the **Browse for Folder** dialog box.
   b. Click **OK**. The file path appears in the **Save results...** field.
8. If you want to include the time the plate was read in the file name, select **Include timestamp in file name**.
9. If you want to include the plate number in the file name, select **Include plate number in file name**.
10. Optionally, enter any comments in the **Notes** field.

Related information

For information about...	See...
Configuring the Multiskan	“Workflow for configuring the Multiskan Ascent” on page 448
Adding a device to the device manager	“Adding devices” on page 107
Adding tasks to protocols	“Adding a task or pipette task” on page 168
Using Multiskan Diagnostics	“Using Multiskan Ascent Diagnostics” on page 454

Using Multiskan Ascent Diagnostics

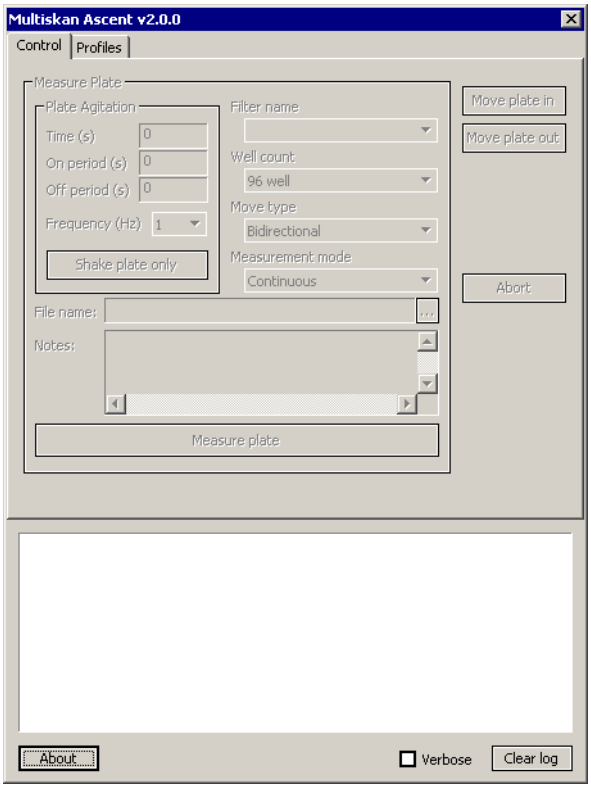
About this topic

This topic describes how to load and read a plate on a Multiskan Ascent and to manage its profiles.

Procedures

To load and read a plate:

1. Open Multiskan Ascent **Device Diagnostics**.
2. Click the **Control** tab.



3. Place the plate you want to read on the Multiskan Ascent loading platform.
4. Click **Move plate in**.
5. If you want to shake the plate, set the **Plate Agitation** parameters.
   a. Enter the total amount of time (in seconds) for the shake process in the **Time** field.
   b. Enter the amount of time (in seconds) you want to shake for each shake interval in the **On period** field.
   c. Enter the amount of time (in seconds) you want to rest in between shake periods in the **Off period** field.
   d. Select the shaking frequency from the **Frequency** list box.
6. Select the filter to use for the reading from the **Filter** name list box.

7. Select the correct plate type from the **Well count** list box.
8. Select the type of read motion you want to use from the **Move type** list box.
9. Select the type of measurement you want to use from the **Measurement mode** list box.
10. Click the ellipsis button (...) to open the **Browse for Folder** dialog box and select the folder to which you want the read data to be saved.
11. Type in any notes you want to record for the plate read in the **Notes** field.
12. Click **Measure plate**.
13. To stop the read after it has started, click **Abort**.

Managing profiles

To edit an existing profile:

1. Click the **Profiles** tab in the **Multiskan Ascent** dialog box.
2. From the **Profile** list box, select the profile you want to modify.
3. Edit the profile settings and click **Update this profile** to save the changes.

To duplicate an existing profile:

1. Click the **Profiles** tab in the **Multiskan Ascent** dialog box.
2. From the **Profile** list box, select the profile you want to duplicate.
3. Click **Create a copy of this profile.**
4. In the **Copy Profile** dialog box, enter the new name for the copied profile and click **OK**.

To delete a profile:

1. Click the **Profiles** tab in the **Multiskan Ascent** dialog box.
2. From the **Profile** list box select the profile you want to delete.
3. Click **Delete this profile**.
4. In the **alert** dialog box, click **Yes** to delete the profile.

To rename a profile:

1. Click the **Profiles** tab in the **Multiskan Ascent** dialog box.
2. From the **Profile** list box select the profile you want to rename.
3. Click **Rename this profile**.
4. In the **Rename Profile** dialog box, enter the new name and click **OK**.

Related information

For information about...	See...
Opening Multiskan Ascent Diagnostics	“Opening diagnostics software” on page 105
Configuring the Multiskan	“Workflow for configuring the Multiskan Ascent” on page 448
Adding a device to the device manager	“Adding devices” on page 107
Setting Multiskan task parameters	“Setting Multiskan Ascent task parameters” on page 452
Creating a Multiskan profile	“Creating a Multiskan Ascent profile” on page 449

Nanodrop: setting up and using

24

This chapter is for people with Administrator or Technician privileges.

The Nanodrop is an 8-channel pipettor that dispenses 0.1–40 µL of liquid into each well of a microplate. It can be integrated into a lab automation system that is run using VWorks.

This chapter describes how to configure the Nanodrop instrument, set the Nanodrop task parameters, and use Nanodrop Diagnostics.

Workflow for configuring the Nanodrop

About this topic

This topic gives the workflow for configuring the Nanodrop.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating a Nanodrop profile" on page 459
3.	"Setting the generic properties for a device" on page 112
4.	"Setting the Nanodrop device properties" on page 461

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Setting Nanodrop task parameters	"Setting Nanodrop task parameters" on page 462
Using Nanodrop Diagnostics	"Using Nanodrop Diagnostics" on page 463

Creating a Nanodrop profile

About this topic

This topic describes how to create a profile for the Nanodrop in VWorks.

A profile is one or more settings that are remembered after you exit VWorks. In the case of the Nanodrop, the only setting stored in a profile is the COM port, which identifies the serial port on the computer to use when connecting the Nanodrop.

You need to have a unique profile for each Nanodrop in your system.

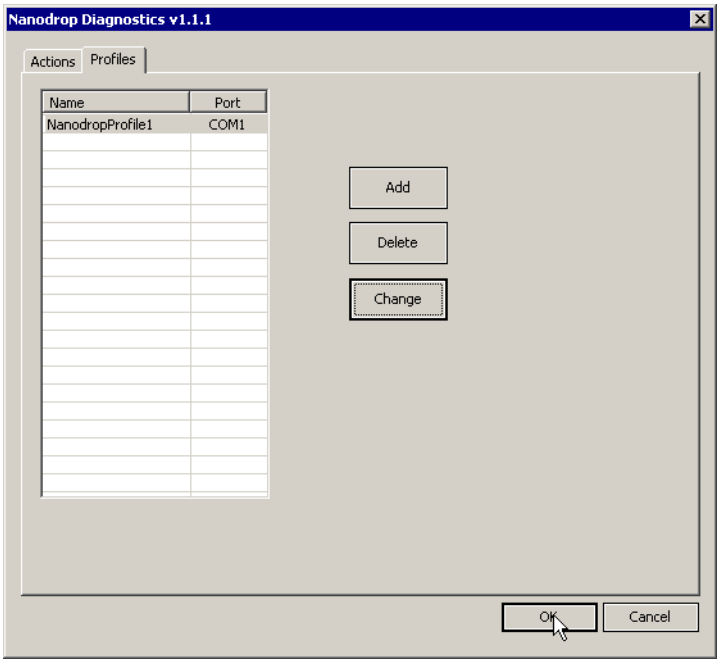
Before you start

Before you can create a Nanodrop profile, you need to add the device to the device manager.

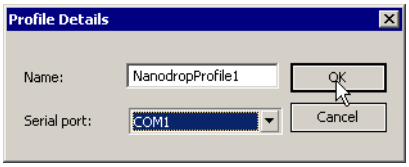
Procedure

To create a Nanodrop profile:

1. Open **Nanodrop Diagnostics**.
2. Click the **Profiles** tab.



3. Click **Add**.
4. In the **Profile Details** dialog box, enter a name for the profile and select the port from the **Serial port** list box. This is the port you are using to connect the Nanodrop to the computer running VWorks.



5. Click **OK**.

   The profile name appears in the **Name** column.
6. In the **Actions** tab, select the profile from the **Profile** list box.
7. Click **OK** to close the **Nanodrop Diagnostics** dialog box.

Related information

For information about...	See...
Profiles	“About profiles” on page 103
The next step	“Setting the generic properties for a device” on page 112
The workflow this procedure belongs to	“Workflow for configuring the Nanodrop” on page 458
Opening Nanodrop Diagnostics	“Opening diagnostics software” on page 105
Adding a device to the device manager	“Adding devices” on page 107
Setting Nanodrop task parameters	“Setting Nanodrop task parameters” on page 462
Using Nanodrop Diagnostics	“Using Nanodrop Diagnostics” on page 463

Setting the Nanodrop device properties

About this topic

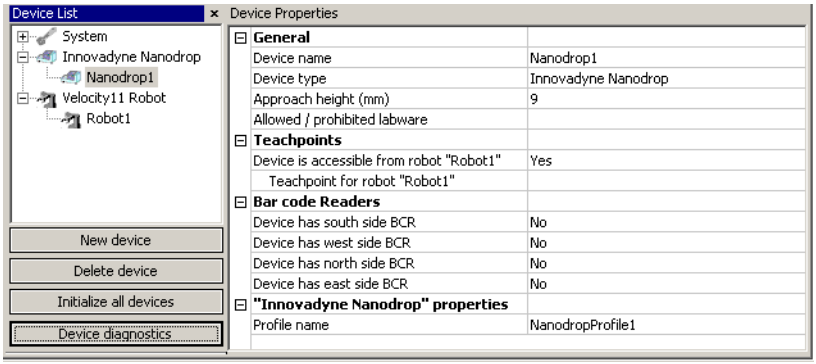
This topic describes how to set the Nanodrop device properties.

The device properties provides VWorks with additional information about the Nanodrop's current configuration. The device properties settings are stored in the device file.

Procedure

To set the Nanodrop device properties:

1. Open the **Device Properties** page.
2. Set the generic device properties.



3. Expand the **Innovadyne Nanodrop properties** group.
4. Double-click on the field adjacent to **Profile name**.
5. Choose a profile from the list box.
6. Save the **Device Properties** settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this procedure belongs to	"Workflow for configuring the Nanodrop" on page 458
Adding a device to the device manager	"Adding devices" on page 107
Opening Nanodrop device properties page	"Adding devices" on page 107
Setting generic device properties	"Setting the generic properties for a device" on page 112
Setting Nanodrop task parameters	"Setting Nanodrop task parameters" on page 462
Using Nanodrop Diagnostics	"Using Nanodrop Diagnostics" on page 463

Setting Nanodrop task parameters

About this topic

This topic describes how to set the Nanodrop task parameters in VWorks software.

NanoDrop task defined

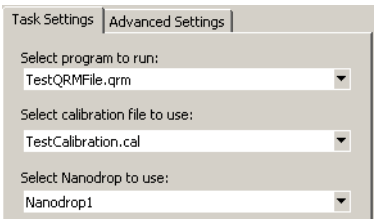
The NanoDrop task moves a plate to a NanoDrop liquid dispenser and runs a pre-defined program, using a calibration file for more accurate dispensing.

Procedure

To set NanoDrop task parameters:

1. Add the NanoDrop task to a protocol process.
2. In the **Task Settings** page of the **Protocol Task Parameter** toolbar, select the following from the list boxes:
   a. The program to run.
   b. The calibration file to use.
   c. The Nanodrop to use, if your VWorks has more than one.

   The name of the Nanodrop is defined in the device manager.



Related information

For information about...	See...
Configuring the Nanodrop	"Workflow for configuring the Nanodrop" on page 458
Adding a device to the device manager	"Adding devices" on page 107
Adding tasks to protocols	"Adding a task or pipette task" on page 168
Using Nanodrop Diagnostics	"Using Nanodrop Diagnostics" on page 463

Using Nanodrop Diagnostics

About this topic

This topic describes how to:

- ❑ Manage Nanodrop profiles, which are used to communicate with the computer.
- ❑ Perform an individual operation, such as a dispense or wash, using the parameters set in a Quick Run Method, and referencing a calibration file for increased accuracy.

Managing profiles

To modify a Nanodrop profile:

1. Open **Nanodrop Diagnostics**.
2. Click the **Profiles** tab.
3. Select the profile you want to modify and click **Change**.
4. Enter your changes in the **Profile Details** dialog box.
5. Click **OK**.

To delete a profile:

1. Open **Nanodrop Diagnostics**.
2. Click the **Profiles** tab.
3. Select the profile you want to delete and click **Delete**.

Running an individual operation

You can use Nanodrop Diagnostics to perform the following actions:

Action	Meaning
Prime	Priming clears air bubbles from the syringe path tubing. Prime the Nanodrop if it has been left idle for more than two hours.
Dispense	Delivers liquid into the plate wells.
Wash	Cleans the insides and outsides of the tips. The operation is performed with the tips immersed in the wash station.
Rinse	Cleans the insides of the tips. The operation is performed above the wash station in the park position.
Purge	Purging clears air bubbles from the pressure path and syringe path. Purging is often performed after priming to make sure that the valves contain no air.

The actions use the settings in the selected QRM file, and any calibration corrections from the selected calibration file.

To perform an individual operation:

1. From the **Files** group box, of the **Actions** page select a QRM file and calibration file.

2. Click a button to start an action.
3. If you want to stop the action, click **Abort**.

About calibration files

Calibration files contain the results of gravimetric calibration tests and are used to adjust the volume delivery process to make sure that the volumes delivered are accurate.

Calibration files are initially provided by Innovadyne, but you can perform your own calibrations, the results of which are stored in a file. Calibrations are performed through Innovadyne's Nanodrop software and the files can only be selected through the Velocity11 Nanodrop Diagnostics software.

About QRM files

QRM (Quick Run Method) files store collections of Nanodrop settings. QRM files are created through Innovadyne's Nanodrop software and are selected through the Velocity11 Nanodrop Diagnostics software.

Examples of settings stored in QRM files are:

- ❑ Dispense volume
- ❑ Syringe volume
- ❑ Tip clean (enabled or disabled)
- ❑ Aspirating air gap rate
- ❑ Whether or not to wash

Related information

For information about...	See...
Opening Nanodrop Diagnostics	"Adding devices" on page 107
Configuring the Nanodrop	"Workflow for configuring the Nanodrop" on page 458
Adding a device to the device manager	"Adding devices" on page 107
Setting Nanodrop task parameters	"Setting Nanodrop task parameters" on page 462
Creating an Nanodrop profile	"Creating a Nanodrop profile" on page 459

QFill: setting up and using

25

This chapter is for people with Administrator or Technician privileges. It describes how to configure the QFill, set the QFill task parameters, and use QFill Diagnostics.

Workflow for configuring the QFill

About this topic

This topic presents the workflow for configuring the Qfill in VWorks.

The QFill dispenses liquids into plate wells and offers the option of vacuum filtration.

Note: If you want to use vacuum filtration, your QFill must include the vacuum station option developed by Velocity11.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating a QFill profile" on page 467
3.	"Setting the generic properties for a device" on page 112
4.	"Setting QFill device properties" on page 468

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Setting QFill task parameters	"Setting QFill task parameters" on page 469
Using QFill Diagnostics	"Using QFill Diagnostics" on page 470

Creating a QFill profile

About this topic

This topic describes how to create a profile that identifies the QFill on the lab automation network.

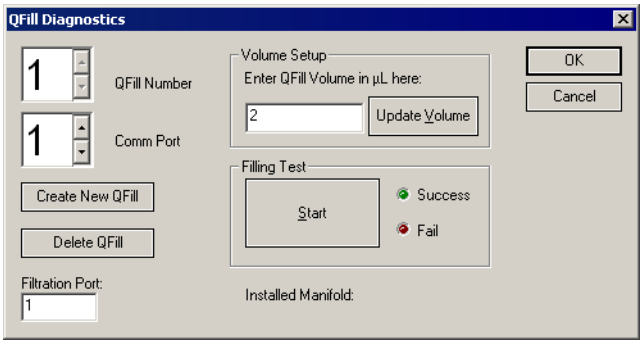
Before you start

Before you can identify the QFill, you need to add the device to the device manager.

Procedure

To create a QFill profile:

1. Open **QFill Diagnostics**.



2. If this is the only QFill on the system, the **QFill Number** should display**1**.
3. If you are adding an additional QFill, click **Create New QFill**.

   The **QFill Number** increments to **2**.
4. Using the up/down arrows, select the **Comm Port** that the QFill is using to communicate with the computer running VWorks.

Related information

For information about...	See...
Opening QFill Diagnostics	“Opening diagnostics software” on page 105
The next step	“Setting the generic properties for a device” on page 112
The workflow this procedure belongs to	“Workflow for configuring the QFill” on page 466
Adding a device to the device manager	“Adding devices” on page 107
Setting QFill task parameters	“Setting QFill task parameters” on page 469
Using QFill Diagnostics	“Using QFill Diagnostics” on page 470

Setting QFill device properties

About this topic

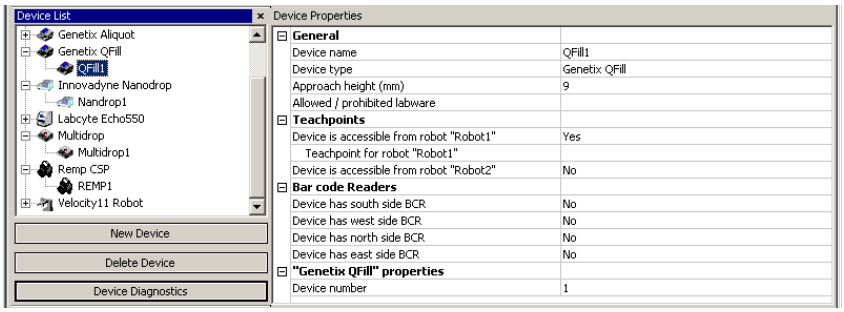
This topic describes how to set the QFill's device properties.

The device properties provide VWorks with additional information about the QFill's current configuration. The device properties settings are stored in the device file.

Procedure

To set QFill device properties:

1. Open the **Device Properties** page.
2. Set the generic device properties.



3. Expand the **Genetix QFill properties** group.
4. Double-click in the field adjacent to **Device number** and choose the appropriate QFill number from the list box.
5. Save the **Device Properties** settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this procedure belongs to	"Workflow for configuring the QFill" on page 466
Opening QFill device properties page	"Adding devices" on page 107
Adding a device to the device manager	"Adding devices" on page 107
Setting QFill task parameters	"Setting QFill task parameters" on page 469
Using QFill Diagnostics	"Using QFill Diagnostics" on page 470

Setting QFill task parameters

About this topic

This topic describes how to set the QFill task parameters in VWorks.

QFill task defined

The QFill task dispenses liquids into plate wells and offers the options of vacuum filtration.

If you want to use vacuum filtration, your QFill must include the vacuum station option developed by Velocity11.

For more information about setting up vacuum filtration as a separate task, contact the Velocity11 Service Center.

Procedure

To set the QFill task parameters:

1. Add a **QFill** task to a protocol process.
2. In the **Task Settings** page of the **Protocol Task Parameter** toolbar, enter the volume of liquid that you want to dispense into each plate well.
3. In the **Available devices** box, select the QFill that you want to use for this task and click **Add**.

   The name of the device moves to the **Devices to use** list.
4. If you want to use vacuum filtration, in the **Filtration** group box:
   a. Select the **Use filtration** check box.
   b. Complete the **Begin filtration...** sentence, specifying how long before or after filling you want the filtration to start.
   c. Type a filtration duration in the **Filter for** text box.
   d. If you want to add a post-filtration delay, type the delay time in the remaining text box.

      The delay is the time that elapses before the robot will pick up the plate, allowing the vacuum under the plate to dissipate.

If this value is too small, the robot may not pick up the plate correctly, causing a robot crash.

Related information

For information about...	See...
The workflow this procedure belongs to	“Workflow for configuring the QFill” on page 466
Adding a device to the device manager	“Adding devices” on page 107
Adding tasks to protocols	“Adding a task or pipette task” on page 168
Using QFill Diagnostics	“Using QFill Diagnostics” on page 470

Using QFill Diagnostics

About this topic

In stand-alone mode, a QFill is operated using a built-in keypad. Velocity11 has developed QFill Diagnostics to allow users to operate a QFill using VWorks software.

This topic explains how to perform simple manipulations of a Genetix QFill2 in real time.

Procedure

To dispense into a plate:

1. Make sure that there is a plate on the QFill stage.
2. Make sure that the reagent bottle has sufficient liquid in it for the dispense.
3. Set the dispense volume:
   a. In the **Volume Setup** group box, type the QFill volume into the text box.
   b. Click **Update Volume**.
   c. Click **OK**.

      The volume you last entered is saved until the next time a protocol is run, which will override this value.
4. In the **Filling Test** group box, click **Start**.
5. Monitor the success of the fill by looking at the **Success** and **Fail** indicators.

   The **Success** and **Fail** indicators provide feedback from a sensor that measures pressure in the dispensing bottle. The **Fail** indicator light is illuminated if the:

   - QFill2 is not turned on
   - QFill2 has a disconnected communication cable
   - Bottle fails to pressurize

About the filtration port

The Filtration Port defines the Bio I/O port used to provide vacuum sensor information for an optional filtration station on the QFill2. You should not need to change this number.

Related information

For information about...	See...
Preparing to fill a plate	*QFill User Guide*
Configuring the QFill	"Workflow for configuring the QFill" on page 466
Adding a device to the device manager	"Adding devices" on page 107
Setting QFill task parameters	"Setting QFill task parameters" on page 469

Remp CSP: setting up and using 26

This chapter is for people with Administrator or Technician privileges.

The Remp CSP is a plate sealer than can be integrated into a lab automation system that is run using VWorks.

This chapter describes how to configure the Remp CSP and Remp CSP task parameters.

Workflow for configuring the Remp CSP

About this topic

This topic presents the workflow for configuring the Remp CSP in VWorks.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating a Remp CSP profile" on page 474
3.	"Setting the generic properties for a device" on page 112
4.	"Setting the Remp CSP device properties" on page 476

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Setting Remp CSP task parameters	"Setting Remp CSP task parameters" on page 477

Creating a Remp CSP profile

About this topic

This topic describes how to create a profile for the Remp CSP in VWorks.

Before you start

Before you can create a profile, you must first:

1. Create a device in the Remp CSP software.

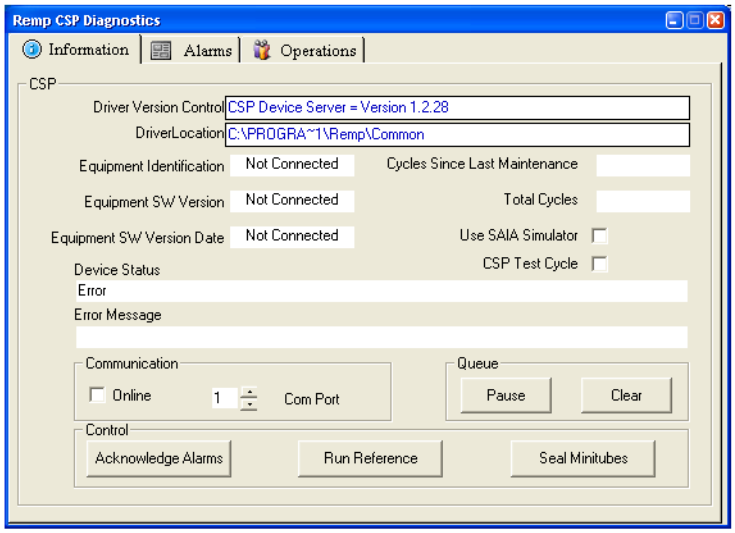
   Refer to the Remp CSP user manual for a procedure.

   Unlike other devices, this process creates a VWorks profile with the same name.
2. Add the Remp CSP to the **Device Manager**.
3. Select the profile name (if more than one).

Procedure

To set up or change a Remp CSP profile:

1. Open Remp CSP **Device Diagnostics**.



2. Use the up/down arrow keys to enter the correct **Com Port**. This is the port the device uses to connect to the controlling computer.

Related information

For information about...	See...
Creating a device in Remp software	*Remp CSP User Guide*
Opening Remp CSP Diagnostics	"Opening diagnostics software" on page 105
Adding a device to the device manager	"Adding devices" on page 107
The next step	"Setting the generic properties for a device" on page 112
The workflow this procedure belongs to	"Workflow for configuring the Remp CSP" on page 474
Setting Remp CSP task parameters	"Setting Remp CSP task parameters" on page 477

Setting the Remp CSP device properties

About this topic

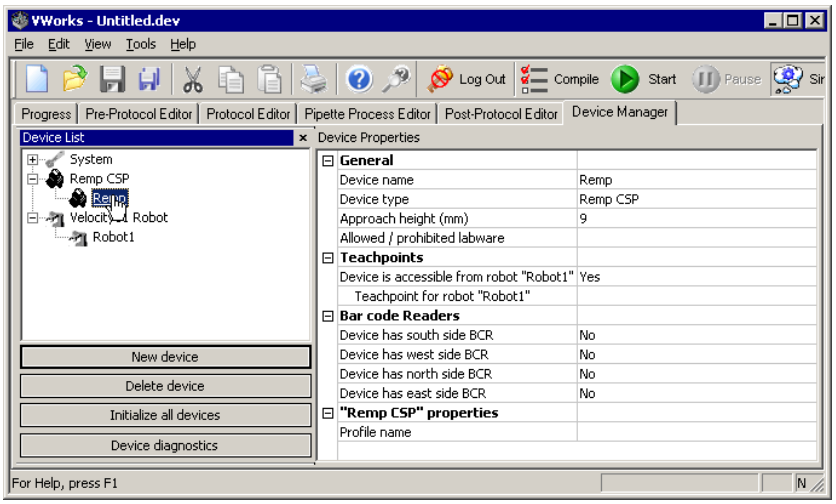
This topic describes how to set Remp CSP's device properties.

The device properties provides VWorks with additional information about the Remp CSP's current configuration. The device property settings are saved in the device file.

Procedure

To set the Remp CSP's device properties:

1. Open the **Device Properties** page.
2. Set the generic device properties.



3. Expand the **Remp CSP properties** group.
4. Double-click in the field adjacent to **Profile name** and choose a profile from the list box.

   Note: Profile names match the device names created in Remp CSP software.
5. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this procedure belongs to	"Workflow for configuring the Remp CSP" on page 474
Opening Remp CSP device properties	"Adding devices" on page 107
Setting the generic device properties	"Setting the generic properties for a device" on page 112
Adding a device to the device manager	"Adding devices" on page 107
Setting Remp CSP task parameters	"Setting Remp CSP task parameters" on page 477

Setting Remp CSP task parameters

Remp CSP task defined

The Remp CSP task moves a plate to the Remp CSP device.

Procedure

There are no adjustable settings for the Remp CSP task.

Related information

For information about...	See...
The workflow this procedure belongs to	"Workflow for configuring the Remp CSP" on page 474
Adding a device to the device manager	"Adding devices" on page 107

Teleshake: setting up and using 27

This chapter is for people with Administrator or Technician privileges. It describes how to configure the Teleshake device, set the Teleshake task parameters, and use Teleshake Diagnostics.

Workflow for configuring the Teleshake

About this topic

This topic gives the workflow for configuring the Teleshake.

The Teleshake is a plate shaker that can be integrated into a lab automation system that is controlled by VWorks.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Setting the generic properties for a device" on page 112
3.	"Setting the Teleshake device properties" on page 481

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Setting Teleshake task parameters	"Setting Teleshake task parameters" on page 482
Using Teleshake Diagnostics	"Using Teleshake Diagnostics" on page 483

Setting the Teleshake device properties

About this topic

This topic describes how to set the Teleshake Device Properties.

The Device Properties provides VWorks with information about the Teleshake's current configuration. The Device Properties settings are stored in the device file.

Before you start

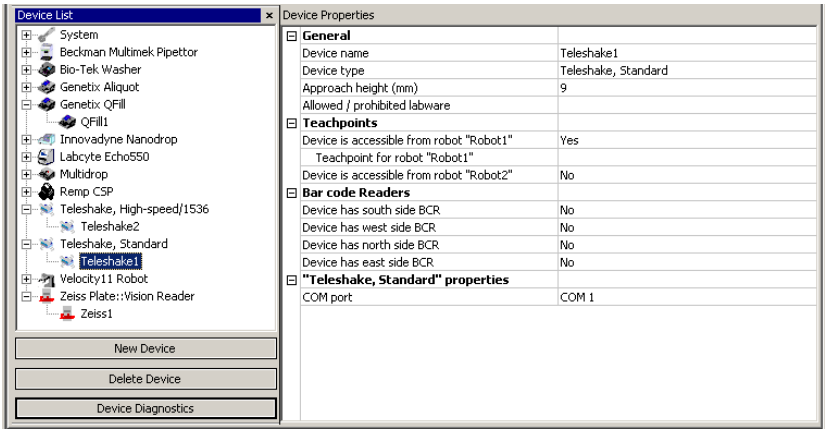
Before you can set the Device Properties, you need to add the Teleshake device to the device manager.

!! IMPORTANT !! There are two types of Teleshake devices: Standard and Hi-speed. Make sure that you added the correct device to the device manager.

Procedure

To set the Teleshake device properties:

1. Open the **Device Properties** page.



2. Expand the **Teleshake, type properties** group.
3. Double-click in the adjacent field to **COM port** and from the list box, select the port the Teleshake is using to communicate to the computer running VWorks.
4. Save the **Device Properties** settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this procedure belongs to	"Workflow for configuring the Teleshake" on page 480
Opening Teleshake device properties	"Adding devices" on page 107
Adding a device to the device manager	"Adding devices" on page 107
Setting Teleshake task parameters	"Setting Teleshake task parameters" on page 482
Using Teleshake Diagnostics	"Using Teleshake Diagnostics" on page 483

Setting Teleshake task parameters

About this topic

This topic describes how to set the Teleshake task parameters.

Teleshake task defined

There are two types of Teleshakes:

- ❑ Standard
- ❑ High Speed

For a standard Teleshake, the Teleshake task moves a plate to a Teleshake plate shaker and shakes it for a specified time, in a specified direction, and at a specified speed.

The high-speed Teleshake task is the same except that it does not specify a direction.

Procedure

To set standard Teleshake parameters:

1. Click the **Teleshake** task icon in the **Protocol Tasks** list and drag it to the desired place in the protocol process window.
2. In the **Protocol Task Parameter** toolbar, enter a number in the **RPM** text field to indicate the speed of the shaking.
3. Select the direction of shaking from the **Direction** list box.

   Directions are specified using the points of the compass and can be in a circular motion, for example **NWSE**, or in a back-an-forth motion for example, **NS**.
4. In the **Duration** text field, enter the duration (in milliseconds) to shake.

To set high speed parameters:

1. Click the **Teleshake (high speed)** task icon in the **Protocol Tasks** list and drag it to the desired place in the protocol process window.
2. In the **Protocol Task Parameter** toolbar, enter a number in the **RPM** text field to indicate the speed of the shaking.
3. In the **Duration** text field, enter the duration (in milliseconds) to shake.

Related information

For information about...	See...
Configuring the Teleshake	"Workflow for configuring the Teleshake" on page 480
Adding a device to the device manager	"Adding devices" on page 107
Using Teleshake Diagnostics	"Using Teleshake Diagnostics" on page 483

Using Teleshake Diagnostics

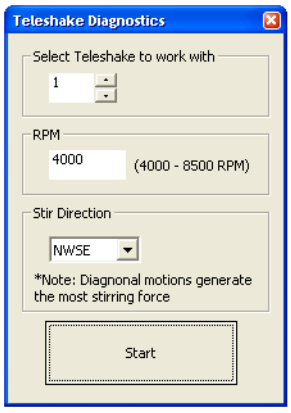
About this topic

This topic describes how to use Teleshake Diagnostics to manually operate the shaker at a desired speed and in a desired direction.

Procedure

To use Teleshake Diagnostics:

1. Open **Teleshake Diagnostics**.



2. If you have more than one Teleshake device, select it using the up/down increment arrows in the **Select Teleshake to work with** field.
3. Enter the speed you want to shake at in the **RPM** field. The allowable range is shown in the parentheses.

4. Select the direction you want to shake from the **Stir Direction** list box.
5. Click **Start** when you want to begin shaking.

Related information

For information about...	See...
Configuring the Teleshake	"Workflow for configuring the Teleshake" on page 480
Adding a device to the device manager	"Adding devices" on page 107
Opening Teleshake Diagnostics	"Opening diagnostics software" on page 105
Setting Teleshake task parameters	"Setting Teleshake task parameters" on page 482

Ultramark: setting up and using 28

This chapter is for people with Administrator or Technician privileges.

The Ultramark microplate imager/reader allows you to examine any plate format, from a single well to 1,536 wells and it can be integrated into a lab automation system that uses VWorks.

This chapter describes how to configure the Ultramark, set the Ultramark task parameters, and use Ultramark Diagnostics.

Workflow for configuring the Ultramark

About this topic

This topic presents the workflow for configuring the Ultramark in VWorks.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Setting the generic properties for a device" on page 112
3.	"Setting the Ultramark device properties" on page 487
4.	"Setting up the Ultramark plate reader data file" on page 488

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Setting Ultramark task parameters	"Setting Ultramark task parameters" on page 489
Using Ultramark Diagnostics	"Using Ultramark Diagnostics" on page 491

Setting the Ultramark device properties

About this topic

This topic describes how to set the Ultramark device properties.

The device properties provides VWorks with additional information about the Ultramark's current configuration. The device property settings are stored in the device file.

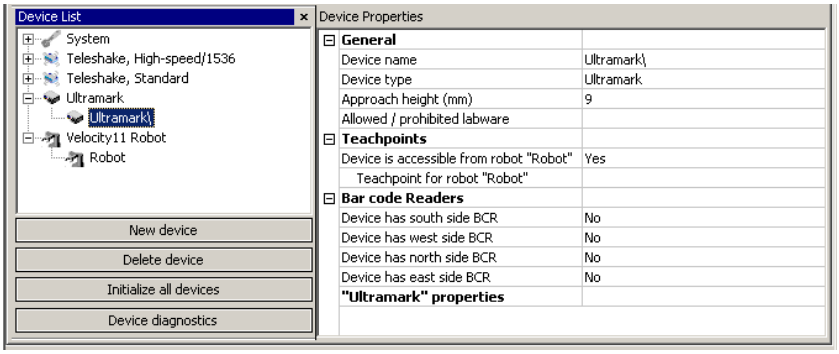
Before you start

Before you can set the device properties, you need to add the Ultramark device to the device manager.

Procedure

To set the Ultramark's device properties:

1. Open the **Device Properties** page.
2. Set the generic device properties.



3. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The next step	"Setting up the Ultramark plate reader data file" on page 488
The workflow this topic belongs to	"Workflow for configuring the Ultramark" on page 486
Setting up Ultramark generic device properties	"Setting the generic properties for a device" on page 112
Setting up devices	"Workflow for setting up devices" on page 106
Opening Ultramark device properties page	"Adding devices" on page 107
Setting Ultramark task parameters	"Setting Ultramark task parameters" on page 489
Using Ultramark Diagnostics	"Using Ultramark Diagnostics" on page 491

Setting up the Ultramark plate reader data file

About this topic

This topic explains how to define where the plate reader data files are stored.

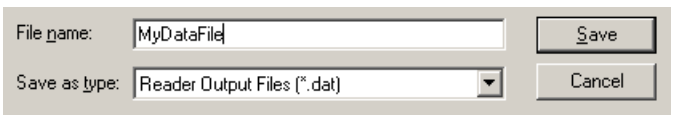
The Ultramark plate reader measures the absorbance of samples in microplate wells and stores the measurement data in a comma-separated file on the controlling computer.

Setting the plate reader data file folder

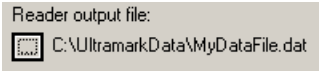
To set the data file output folder:

1. Select **Tools > Options**.
2. In the **VWorks Options** dialog box, click the **Log Options** tab.
3. Click the **Reader output file** ellipsis button.

4. Navigate to the folder in which you want to store the data file.
5. Enter a file name, but leave off the extension.



6. Click **Save** and make sure that the correct file path is displayed.



7. Click **OK**.

Related information

For information about...	See...
The workflow this procedure belongs to	"Workflow for configuring the Ultramark" on page 486
Adding a device to the device manager	"Adding devices" on page 107
Setting Ultramark task parameters	"Setting Ultramark task parameters" on page 489
Using Ultramark Diagnostics	"Using Ultramark Diagnostics" on page 491

Setting Ultramark task parameters

About this topic

This topic describes how to set the Ultramark task parameters in VWorks.

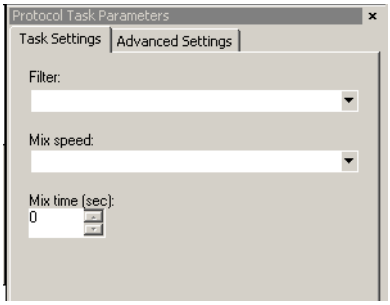
Ultramark task defined

The Ultramark task moves a plate to the Ultramark device where a reading is initiated.

Procedure

To set the Ultramark task parameters:

1. Click the **Ultramark** task icon in the **Protocol Tasks** list and drag it to the desired place in the protocol process window.



2. If you have multiple filters in your Ultramark, select the one you want to use from the **Filter** list box.

3. Select the speed used to mix the plate, if desired, from the **Mix** list box.

   If you have chosen a mix speed, choose the mix time (in seconds) for the plate using the up/down increment arrows next to the **Mix time (sec)** field.

Related information

For information about...	See...
The next step	"Setting up the Ultramark plate reader data file" on page 488
The workflow this procedure belongs to	"Workflow for configuring the Ultramark" on page 486
Adding a device to the device manager	"Adding devices" on page 107
Setting Ultramark task parameters	"Setting Ultramark task parameters" on page 489
Using Ultramark Diagnostics	"Using Ultramark Diagnostics" on page 491

Using Ultramark Diagnostics

About this topic

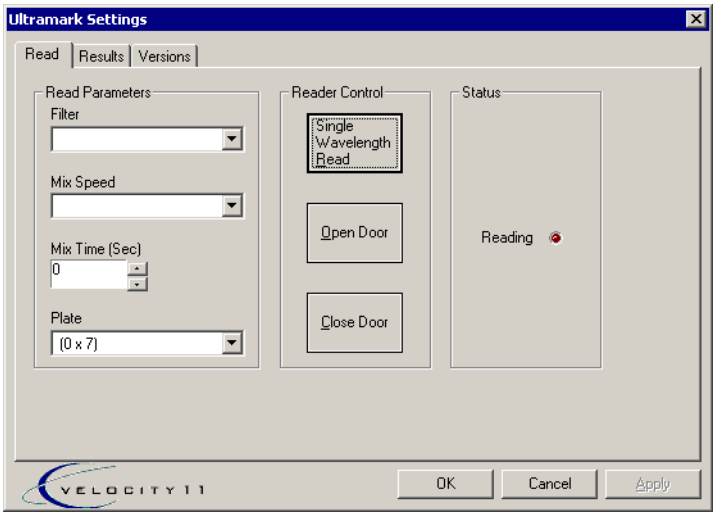
This topic describes how to use Ultramark Diagnostics to:

- ❑ Read a plate
- ❑ Examine and export results
- ❑ View the current connection settings and software versions

Reading a plate with diagnostics

To read a plate using Ultramark Diagnostics:

1. Open the **Ultramark Settings** dialog box.



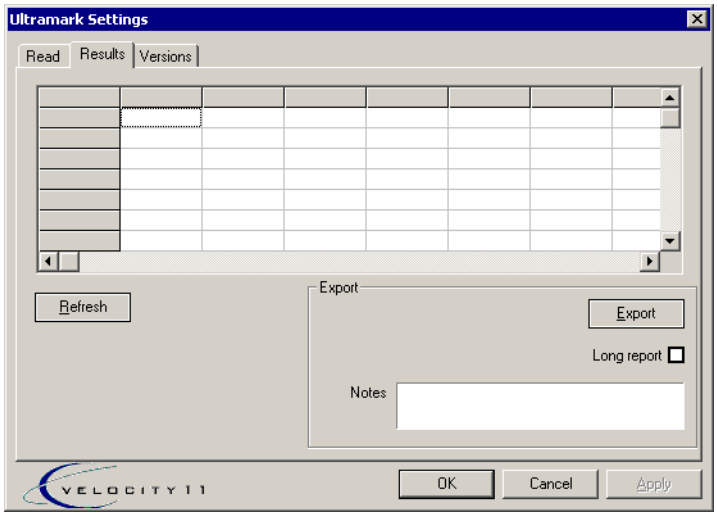
2. Click **Open Door**.
3. Place your plate in the Ultramark device.
4. Click **Close Door**.
5. Select the filter you want to read with from the **Filter** list box.
6. If you want to mix, select the speed from the **Mix Speed** list box.
7. If you are mixing, set the mix time using the up/down increment arrows next to the **Mix Time (sec)** field.
8. Select the plate you are reading from the **Plate** list box.
9. Click **Single Wavelength Read** to start the read.

Viewing read results

To view the results of a read performed in diagnostics:

1. Click the **Device Manager** tab and then select the Ultramark icon in the **Devices List**.
2. Click **Device Diagnostics**.
3. Click the **Results** tab.

   The results of the read are displayed in a column/row format that corresponds to the plate format. Use the scroll bars to see the data that is not displayed.

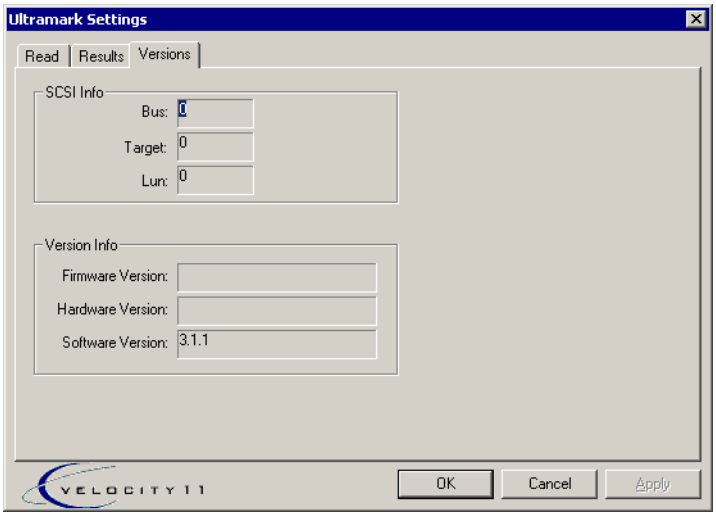


4. To export the data to a comma-delimited text file:
   a. Optionally, record comments regarding the read by entering them in the notes field and then select the **Long report** check box.
   b. Click **Export**.
5. In the **Export** dialog box, navigate to the desired folder, enter a name for the file and click **Save**.

Viewing the version information

To view the software, hardware and firmware versions of the Ultramark Diagnostics:

1. Click the **Device Manager** tab and then select the Ultramark icon in the **Devices List**.
2. Click **Device Diagnostics**.
3. Click the **Versions** tab.



Related information

For information about...	See...
Configuring the Ultramark	"Workflow for configuring the Ultramark" on page 486
Adding a device to the device manager	"Adding devices" on page 107
Opening the Ultramark settings dialog box	"Opening diagnostics software" on page 105
Setting Ultramark task parameters	"Setting Ultramark task parameters" on page 489
Setting up a data file	"Setting up the Ultramark plate reader data file" on page 488

Vici Multiport Valve: setting up and using 29

This chapter is for people with Administrator or Technician privileges. It describes how to configure the Vici Multiport Valve, set the Vici Multiport Valve task parameters, and use Vici Multiport Valve Diagnostics.

Workflow for configuring a Vici Multiport Valve

About this topic

This topic presents the workflow for configuring the Vici Multiport Valve in VWorks.

The Vici Multiport Valve is a switching device that enables you to change between reservoirs of incoming fluids (source) and reservoirs of outgoing fluids (destinations.)

It can be integrated into a lab automation system that is run using VWorks. In order to use it as an integrated device, it needs to be configured in VWorks.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating a Vici Multiport Valve profile" on page 497
3.	"Setting the generic properties for a device" on page 112
4.	"Setting the Vici Multiport Valve device properties" on page 498

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Setting Vici Multiport Valve task parameters	"Setting the Vici Multiport Valve task parameters" on page 499
Using Vici Multiport Valve Diagnostics	"Using Vici Multiport Valve Diagnostics" on page 500

Creating a Vici Multiport Valve profile

About this topic

This topic describes how to create a profile for the Vici Multiport Valve device in VWorks.

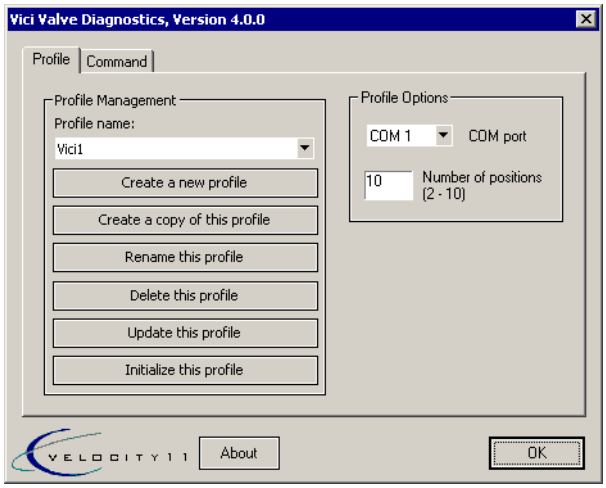
Before you start

Before you can create a profile, you need to add the device to the device manager.

Procedure

To create a Vici Multiport Valve profile:

1. Open **Vici Valve Diagnostics**.
2. Click the **Profile** tab.



3. Click **Create a new profile**, enter a name for the device in the **Create Profile** dialog box, and click **OK**.
4. Select the **Profile Options**:
   a. From the **COM port** list, select the port that the Vici Multiport Valve uses to connect with the computer running VWorks software.
   b. In the **Number of positions** field, enter the number of positions you are using on the multiport valve.
5. Click **Update this profile** and then click **OK** to close the dialog box.

Related information

For information about...	See...
The next step	"Setting the generic properties for a device" on page 112
The workflow this procedure belongs to	"Workflow for configuring a Vici Multiport Valve" on page 496
Adding a device to the device manager	"Adding devices" on page 107
Setting Vici Multiport Valve task parameters	"Setting the Vici Multiport Valve task parameters" on page 499
Using Vici Multiport Valve Diagnostics	"Using Vici Multiport Valve Diagnostics" on page 500

Setting the Vici Multiport Valve device properties

About this topic

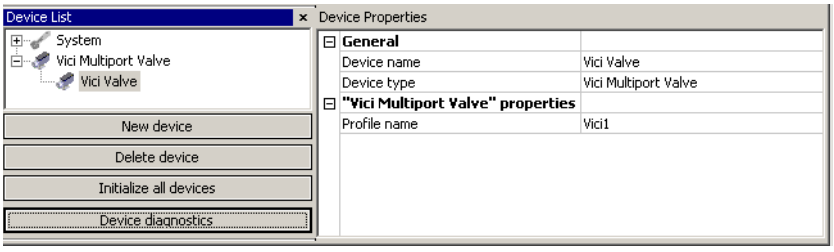
This topic describes how to set the Vici Multiport Valve device properties.

The device properties provide VWorks with additional information about the Vici Multiport Valve's current configuration. The device property settings are stored in the device file.

Procedure

To set the Vici Multiport Valve's device properties:

1. Open the **Device Properties** page.
2. Set the generic device properties for the Vici Multiport Valve.



3. Expand the **Vici Multiport Valve** properties group.
4. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this procedure belongs to	"Workflow for configuring a Vici Multiport Valve" on page 496
Opening the Vici Multiport Valve device properties page	"Adding devices" on page 107
Adding a device to the device manager	"Adding devices" on page 107
Setting Vici Multiport Valve task parameters	"Setting the Vici Multiport Valve task parameters" on page 499
Using Vici Multiport Valve Diagnostics	"Using Vici Multiport Valve Diagnostics" on page 500

Setting the Vici Multiport Valve task parameters

About this topic

This topic describes how to set the Vici Multiport Valve task parameters in VWorks.

Vici Multiport Valve task defined

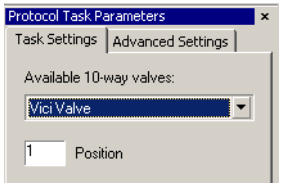
The Vici Multiport Valve task is used to change the position of the valve in the device.

Procedure

To set the Vici Multiport Valve task parameters:

1. Add the **Vici Multiport Valve** task to a protocol process.

2. In the **Task Settings** page of the **Protocol Task Parameters** toolbar, select the Multiport device you want to use from the **Available 10-way valves** list box.
3. In the **Position** field, enter the valve position you want on the Vici Multiport device.



Related information

For information about...	See...
Configuring the Vici Multiport Valve	"Workflow for configuring a Vici Multiport Valve" on page 496
Adding a device to the device manager	"Adding devices" on page 107
Using Vici Multiport Valve Diagnostics	"Using Vici Multiport Valve Diagnostics" on page 500

Using Vici Multiport Valve Diagnostics

About this topic

This topic describes how to use Vici Multiport Valve Diagnostics to:

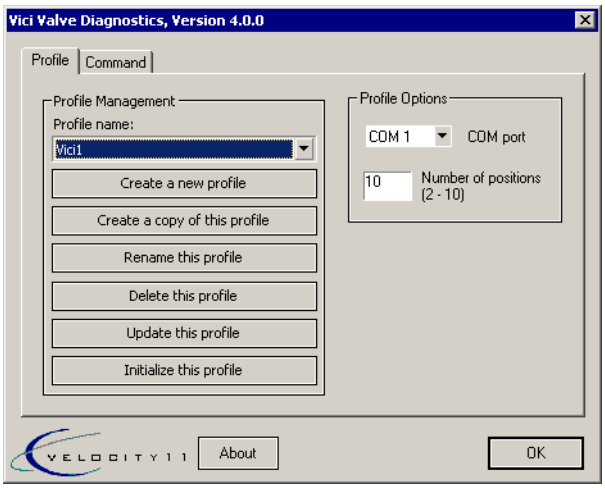
- ❑ Manage profiles
- ❑ Manually operate the device

The manual commands for the Vici Multiport Valve are typically used for initial setup and troubleshooting the device.

Procedure

To manage profiles:

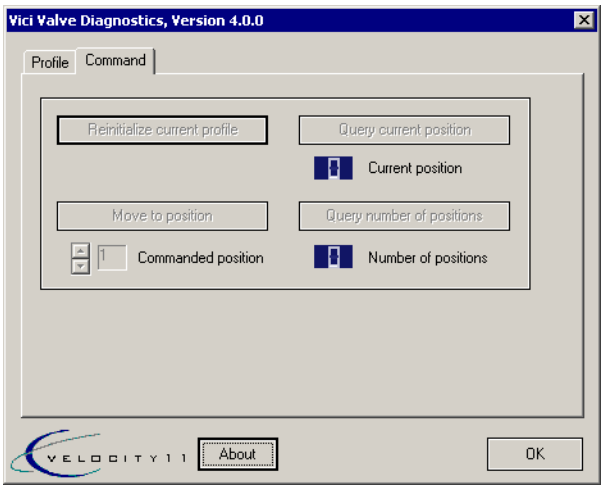
1. Open the **Vici Multiport Valve Diagnostics**.
2. Click the **Profile** tab.



3. Select the profile you want to manage from the **Profile name** list box. Make changes to the profile, if desired.
4. At this point, you may perform any of the operations displayed in the **Profile Management** group box, by clicking on the appropriate button.

To manually operate the device:

1. Open the **Vici Multiport Valve Diagnostics** dialog box:
   a. Make sure the **Device Manager** page is showing and that the Vici Multiport Valve icon is selected in the **Devices List**.
   b. Click **Device Diagnostics**. The **Vici Multiport Valve** dialog box opens.
2. Click the **Commands** tab.



3. To move the valve to another position, enter (or use the arrows) the desired position in the **Commanded position** field and then click **Move to position**.
4. Click **Reinitialize current profile** to command the computer to contact the device using the current selected profile.
5. To confirm the position of the valve as detected by the software, click **Query current position** and then verify the **Current position** display.
6. To confirm the number of valve positions detected by the software, click **Query number of positions** and then verify the **Number of positions** display.
7. Click **OK** to exit the dialog box.

Related information

For information about...	See...
Configuring the Vici Multiport Valve	"Workflow for configuring a Vici Multiport Valve" on page 496
Adding a device to the device manager	"Adding devices" on page 107
Opening Vici Multiport Valve Diagnostics	"Opening diagnostics software" on page 105
Setting Vici Multiport Valve task parameters	"Setting the Vici Multiport Valve task parameters" on page 499
Creating an Vici Multiport Valve profile	"Creating a Vici Multiport Valve profile" on page 497

WellMate: setting up and using 30

This chapter is for people with Administrator or Technician privileges.

The Matrix Technologies WellMate is a liquid dispenser that can be integrated into a robotic system using VWorks.

This chapter describes how to configure the WellMate instrument, set the WellMate task parameters, and use WellMate Diagnostics.

Workflow for configuring the WellMate

About this topic

This topic presents the workflow for configuring the WellMate in VWorks.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Creating a WellMate profile" on page 505
3.	"Setting the generic properties for a device" on page 112
4.	"Setting the WellMate device properties" on page 506

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Setting WellMate task parameters	"Setting WellMate task parameters" on page 507
Using WellMate Diagnostics	"Using WellMate Diagnostics" on page 509

Creating a WellMate profile

About this topic

This topic describes how to create a profile for the WellMate in VWorks.

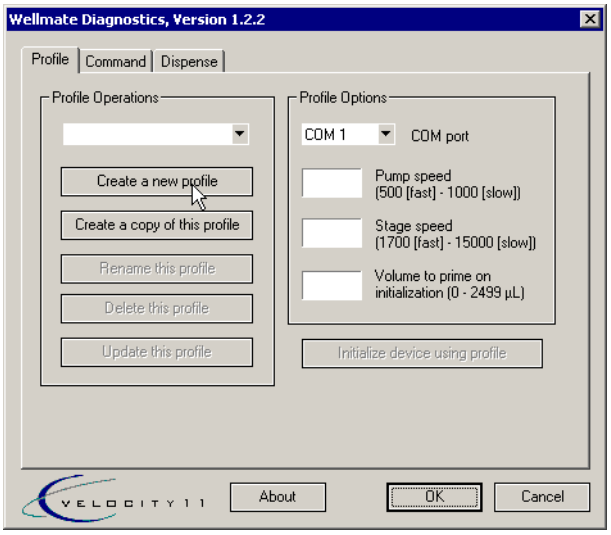
Before you start

Before you can create a profile, you need to add the device to the device manager.

Procedure

To create a WellMate profile:

1. Open **WellMate Diagnostics**.
2. Click the **Profile** tab.



3. Click **Create a new profile**, enter a name for the device in the **New Profile** dialog box and click **OK**.
4. Set the **Profile Options**:
   a. From the **COM port** list box, select the port that the WellMate uses to communicate with the controlling computer.
   b. Enter a value for the **Pump speed**, using the range shown as a guide.
   c. Enter a value for the **Stage speed**, using the range shown as a guide.
   d. Enter a volume in the **Volume to prime on initialization** field if you want to prime the lines when the profile initializes.
5. Click **Update this profile**.
6. If you want to open communications to the WellMate and send the profile settings immediately, click **Initialize device using profile**.
7. Click **OK**.

Related information

For information about...	See...
The next step	"Setting the generic properties for a device" on page 112
The workflow this procedure belongs to	"Workflow for configuring the WellMate" on page 504
Opening WellMate Diagnostics	"Opening diagnostics software" on page 105
Adding a device to the device manager	"Adding devices" on page 107
Setting WellMate task parameters	"Setting WellMate task parameters" on page 507
Using WellMate Diagnostics	"Using WellMate Diagnostics" on page 509

Setting the WellMate device properties

About this topic

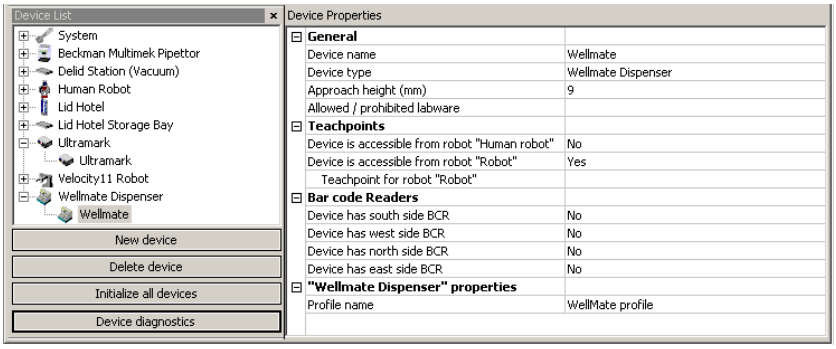
This topic describes how to set the WellMate's device properties.

The device properties provides VWorks with additional information about the WellMate's current configuration. The device property settings are stored in the device file.

Procedure

To set the WellMate's device properties:

1. Open the **Device Properties** page.
2. Set the WellMate generic device properties.



3. Expand the **Wellmate Dispenser properties** group.
4. Double-click in the field adjacent to **Profile name** and choose a profile from the list box.

5. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this procedure belongs to	"Workflow for configuring the WellMate" on page 504
Adding a device to the device manager	"Adding devices" on page 107
Opening WellMate device properties page	"Adding devices" on page 107
Setting WellMate generic device properties	"Setting the generic properties for a device" on page 112
Setting WellMate task parameters	"Setting WellMate task parameters" on page 507
Using WellMate Diagnostics	"Using WellMate Diagnostics" on page 509

Setting WellMate task parameters

About this topic

This topic describes how to set the WellMate task parameters in the VWorks software.

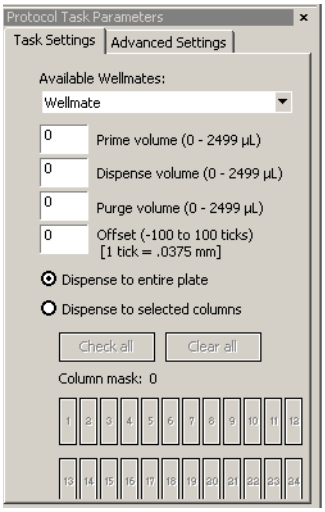
WellMate task defined

The WellMate task moves a plate to a Matrix Technologies WellMate and dispenses liquid into the plate.

Procedure

To set the WellMate task parameters:

1. Add the WellMate task to a protocol process.
2. If your system has more than one WellMate in the **Available Wellmates** list box, select the one you want to use.

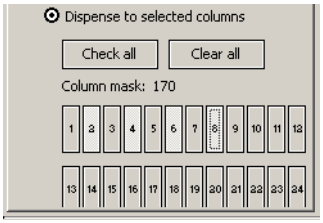


3. Enter values for one or more of the following parameters.

Parameter	Description
Prime volume	The volume of liquid to move through the tubing cartridge before dispensing liquid into a plate
Dispense volume	The volume of liquid to dispense into a plate
Purge volume	The volume of liquid to move through the tubing from the tips back to the reservoir
Offset	Offset defines how far away from the center of the well to dispense

4. To dispense into all wells, make sure that the **Dispense to entire plate** option is selected.
5. To only dispense into some of the wells:
   a. Select the **Dispense to selected columns** option.
   b. Click **Clear All**.
   c. In the number matrix, click the numbers corresponding to the columns to which you want to dispense.

      In the following example, liquid will be dispensed into columns 2, 4, 6, and 8 of a 384-well plate.



Related information

For information about...	See...
Configuring the WellMate	"Workflow for configuring the WellMate" on page 504
Adding tasks to protocols	"Adding a task or pipette task" on page 168
Adding a device to the device manager	"Adding devices" on page 107
Using WellMate Diagnostics	"Using WellMate Diagnostics" on page 509

Using WellMate Diagnostics

About this topic

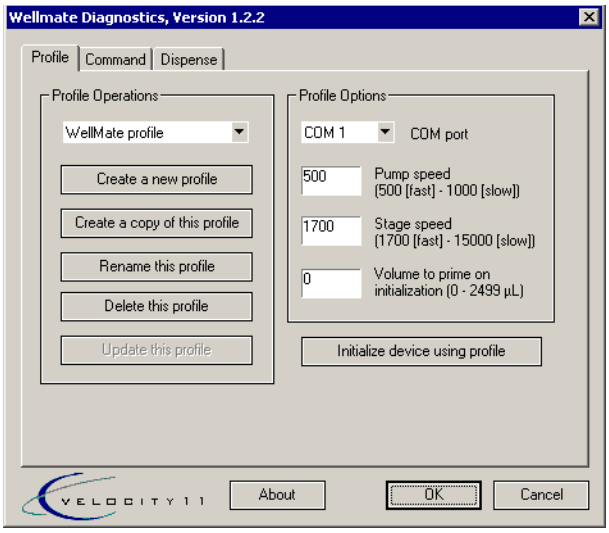
This topic describes how to use WellMate Diagnostics to:

- ❑ Manage profiles
- ❑ Move the plate stage
- ❑ Execute dispense commands

Managing profiles

To manage profiles:

1. Open **WellMate Diagnostics.**
2. Click the **Profile** tab.



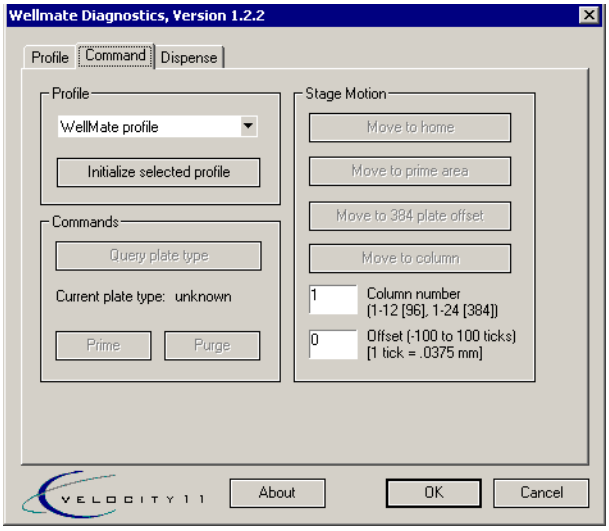
3. Select the profile you want to manage from the **Profile Operations** list box. Make changes to the profile, if desired.

4. At this point, you may perform any of the operations displayed in the **Profile Management** group box, by clicking the appropriate button.

Moving the plate stage

To move the plate stage:

1. Open the **WellMate Diagnostics**.
2. Click the **Command** tab.



3. Perform the desired task using the following table as a guide.

To...	Then...
Home the WellMate	Click **Move to home**.
Move the stage to the priming area	Click **Move to prime area**.
Move the 384-plate offset	Click Move to **384 plate offset**. The stage moves to the end of its travel and then shifts to the next stage for dispensing on a 384-well plate.
Move to a column	Enter the column number you want to move to in the **Column number** field and click **Move to column**.
Change the offset	This works in conjunction with the **Move to Column** command. Enter a value in the **Offset** field and the desired column in the **Column number** field and click **Move to column.** Offset defines how far away from the center of the well to dispense.

Querying the plate type

To query the plate type:

1. Open the **Command** page.
2. To find out the plate type (96- or 384-well) that the WellMate is set for, click **Query plate type**.

   The plate type is displayed next to **Current plate type** text.

Priming and purging

Priming moves the fluid from the reservoir to the tips and purging moves the fluid from the tips to back to the reservoir.

To prime or purge:

1. Open the **Command** page.
2. Click and hold the mouse on the **Prime** or **Purge** button.

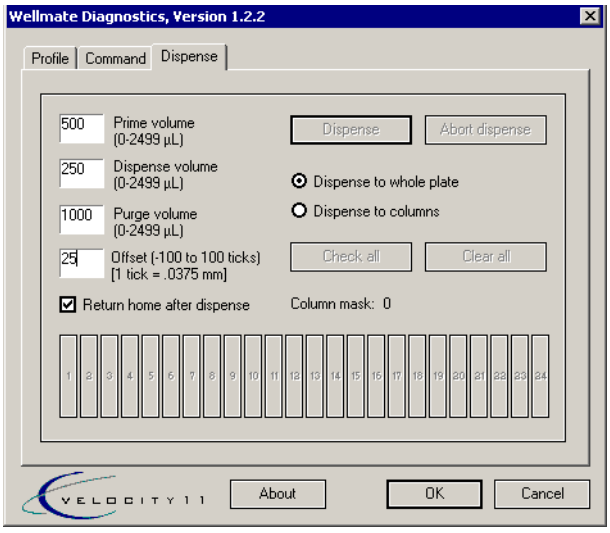
   Fluid is pumped at the **Pump Speed** set in the **Profile** page until you release the mouse.

Executing dispense commands

Use the Dispense page to set the prime, dispense, and purge volumes and to initiate the dispense.

To execute dispense commands:

1. Open the **WellMate Diagnostics** dialog box and click the **Dispense** tab.



2. Enter in the appropriate values using the table below as a guide.

Property	Description
Prime	Volume to prime the lines with before dispensing.
Dispense	Volume to dispense into the wells.

Property	Description
Offset	The distance in ticks (where 1 tick= 0.0375 millimeters) from the center of the well you want to dispense.
Move to a column	Enter the column number you want to move to in the **Column number** field and then click **Move to Column**.

3. Select the wells of the plate to which you want to dispense:
   a. To dispense to the whole plate, click **Dispense to whole plate**.
   b. To dispense to a specific column or columns, click **Dispense to columns** and then click the button(s) corresponding to the column number.

      When selected, the button changes its appearance.
4. When you are ready to dispense, click **Dispense**.

   To stop the dispense process before it is finished, click **Abort dispense**.

Related information

For information about...	See...
Configuring the WellMate	"Workflow for configuring the WellMate" on page 504
Adding a device to the device manager	"Adding devices" on page 107
Opening WellMate Diagnostics	"Opening diagnostics software" on page 105
Opening WellMate Command page	"Moving the plate stage" on page 510
Setting WellMate task parameters	"Setting WellMate task parameters" on page 507
Creating an WellMate profile	"Creating a WellMate profile" on page 505

Zeiss: setting up and using 31

This chapter is for people with Administrator or Technician privileges.

The Zeiss plate::vision reader is a plate reader that can be integrated into a lab automation system that is run using VWorks.

This chapter describes how to configure the Zeiss Plate::Vision reader device and set the Zeiss Plate::Vision reader task parameters.

Workflow for configuring a Zeiss Plate::Vision reader

About this topic

This topic presents the workflow for configuring the Zeiss Plate::Vision reader in VWorks.

Workflow

Step	Topic
1.	"Adding devices" on page 107
2.	"Setting the generic properties for a device" on page 112
3.	"Setting the Zeiss Plate::Vision reader device properties" on page 515

Related information

For information about...	See...
Setting up devices	"Workflow for setting up devices" on page 106
Setting Zeiss task parameters	"Setting Zeiss Plate::Vision reader task parameters" on page 516

Setting the Zeiss Plate::Vision reader device properties

About this topic

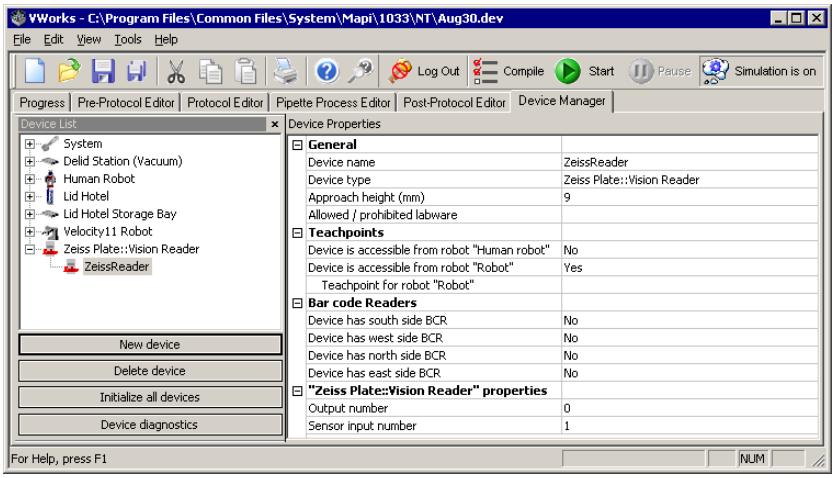
This topic describes how to set the Zeiss Plate::Vision reader device properties.

The device properties provides VWorks with additional information about the Zeiss Plate::Vision reader's current configuration. The device property settings are stored in the device file.

Procedure

To set the Zeiss Plate::Vision reader device properties:

1. Open the **Device Properties** page.
2. Set the Zeiss Plate::Vision reader generic device properties.



3. Expand the **Zeiss Plate::Vision Reader** properties group.
4. Choose the Zeiss Plate::Vision reader properties:
   a. Double-click in the field next to **Output** and enter the number of the output port on the Bio I/O control which opens the door on the enclosure to allow a robot access.
   b. Double-click in the field next to **Sensor input number** and enter the number of the input port on the Bio I/O control which monitors the open/close state of the door.
5. Save the device settings by clicking **File** and selecting **Device File > Save**.

Related information

For information about...	See...
The workflow this procedure belongs to	"Workflow for configuring a Zeiss Plate::Vision reader" on page 514
Opening Zeiss reader device properties	"Adding devices" on page 107
Adding a device to the device manager	"Adding devices" on page 107
Setting Zeiss reader task parameters	"Setting Zeiss Plate::Vision reader task parameters" on page 516

Setting Zeiss Plate::Vision reader task parameters

Zeiss Plate::Vision reader task defined

The Zeiss Plate::Vision reader task moves a plate to a multi-mode plate reader and instructs the reader to perform a particular assay.

Procedure

To set Zeiss Plate::Vision reader task parameters:

1. Add a Zeiss Plate::Vision reader task to a protocol process.
2. In the **Assay** text box of the **Protocol Task Parameters** toolbar, type the name of the assay to run.

   The name must exactly match the name of the assay file, including the file name extension. It is not case sensitive.
3. From the **Bar code to send** list box, select the side of the plate with the bar code that you want to be listed in the reader output data.

Related information

For information about...	See...
Configuring the Zeiss Reader	"Workflow for configuring a Zeiss Plate::Vision reader" on page 514
Adding a device to the device manager	"Adding devices" on page 107
Adding tasks to protocols	"Adding a task or pipette task" on page 168

Maintenance and troubleshooting

32

This chapter tells you what to do when you encounter a problem.

About error handling

About this topic

VWorks is a complex application that requires the interaction of hundreds of parameters, configurations, and operator setup tasks for a protocol to run successfully.

Causes of errors

Errors have many causes, including poor protocol writing, incorrect operator setup, variation in plates, hardware failure, and software failure.

Handling errors during normal operation

It is important to understand that error handling is a normal part of operating a lab automation system and that when errors occur it does not necessarily mean that your lab automation system has malfunctioned.

Sending a bug report

About this topic

This topic describes how to send a bug report to Velocity11 through VWorks.

Requirements

Before you can send a bug report:

- ❑ The system's computer must be connected to a network with internet access.
- ❑ The outgoing email server must be set up on the system's computer by a VWorks or network administrator.

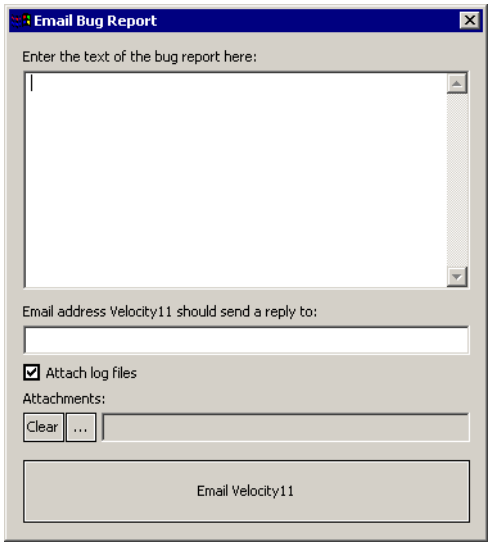
Sending a bug report

A bug report is an email that you create and send from within VWorks. The email is sent directly to Velocity11.

To send a bug report:

1. Select **Help** > **Report a Bug**.

   The **Email Bug Report** dialog box opens.



2. Type a description of the error in the text box.

   In your description, provide a summary of the error and, in the case of a software bug, a description of how we can reproduce it.

3. Attach the following files, which can help us to troubleshoot the problem:

File	Find in...
Protocol file you were running when the problem occurred	The location set by your administrator when saving protocols.
Device file	The location set by your administrator when saving device files.
Protocol log file	The location set in log file options.
Velocity11 registry file	The Windows registry. HKEY_LOCAL_MACHINE\SOFTWARE\Velocity11

   a. Select the **Attach log files** check box.

   b. Click the ellipsis button.

   c. Browse to one of the files listed above and click **Open**.

   d. Repeat this step to attach each remaining file.

4. Click **Email Velocity11** and wait until a **Message Sent** message box appears.

Related information

For information about...	See...
Setting up email so that you can send a bug report	"Setting up email" on page 374

Compilation warnings and errors

About this topic

This topic briefly describes compilation warnings and errors.

Compilation warnings

Warnings alert you to situations that seem to have incorrect intent but that will not cause a collision or a device to fail.

Compilation warnings are displayed in the VWorks log toolbar, listing the task that caused the warning.

Warnings are generated, for example, when:

- ❑ Pipette tips are on the VPrep head at the start of the protocol so a tips-off task is run before a tips-on task
- ❑ No label is printed during a VCode task

Compilation errors

Errors alert you to situations where a protocol or device will fail.

Compilation errors are listed in the Log toolbar, and a dialog box opens telling you how many errors were found. If you are logged in with Technician, Operator, User, or Guest privileges, you are unable to continue with the protocol. If you are logged in with Administrator privileges, the dialog box allows you to run the protocol despite the errors.

Errors are generated, for example, when:

- ❑ Operating parameters are out of range, denoted by red text in fields of the Task Parameters toolbar
- ❑ A task asks a VPrep to pipette from a plate that does not exist in the system
- ❑ Volumes in pipette steps do not match, such as when a dispense volume is greater than a previous aspirate volume
- ❑ A specific stacker has not been assigned to a stacker task
- ❑ A Signal task has no associated Waitfor task

Resolving device errors

About this topic

This topic describes the device initialization process and suggests some things you can try if you encounter problems with device initialization.

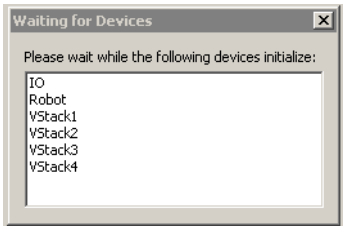
Device initialization process

When you start VWorks, the software loads the driver files for all the devices you have on your system. A record of this process is displayed in the log toolbar.

When you open a protocol file, the device file associated with that protocol opens. The device file tells the software which devices are connected to the system. Then, for some kinds of devices, an initialization step tests the communication between VWorks and the device.

Resolving initialization errors

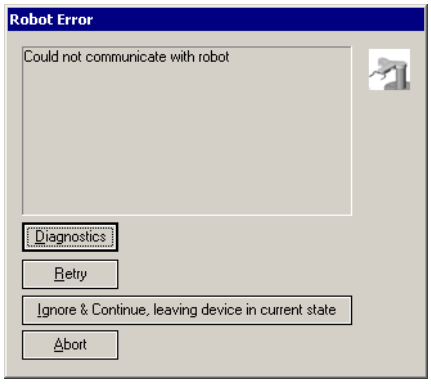
During this process, a message window opens displaying the name of the devices that the software expects to find. Devices are removed from the list as the system computer determines that the devices are ready. In the following example, there are six devices that the software is trying to initialize:



If there is a problem with initializing a device, you receive an error message dialog box for that device.

The problem encountered is stated in the text field of the dialog box.

In this example, VWorks could not initialize the Robot device.



Make sure that the device is turned on and that the communications cable is connected properly.

Click **Diagnostics** and try to resolve the problem in the device profile. If that does not solve the problem, contact the Velocity11 Service Center.

Resolving non-VCode bar code reader errors

About this topic

The information in this topic refers to errors generated by bar code readers that are not attached to a VCode. These include:

- ❑ Robot bar code readers
- ❑ Optional VPrep shelf bar code readers
- ❑ Optional platepad bar code readers

Types of bar code misread errors

There are two types of bar code misread errors.

Error type	Description
Bar code no-read	A bar code reader is unable to read a bar code when it picks up a plate.
Bar code mismatch	The bar code of the plate that is picked up does not match the bar code that VWorks expects for that plate.

Note: VWorks does not attempt to read a bar code unless you have specified (in the plate icon parameters) that incoming plates have bar codes on that side.

Bar code error option

The result of a bar code misread error depends on whether "Halt on bar code misreads" error option is selected.

If the option is selected:

- ❑ The protocol pauses.
- ❑ An error is generated in the log.txt file and VPrep log file.
- ❑ A dialog box opens, allowing you to enter the correct bar code.

If the option is not selected:

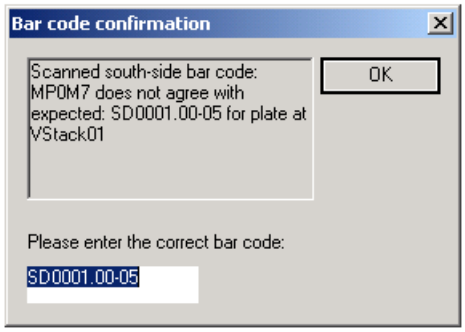
- ❑ An error is generated in the log.txt file and VPrep log file.
- ❑ The protocol continues without pausing so there are no recovery steps.

Bar code no-read errors

When a bar code cannot be read and the "Halt on bar code misreads" error option is selected, an error message is generated stating "Could not read *side* bar code on plate at *device*."

Bar code mismatch errors

When the plate that is picked up does not match the bar code that VWorks expects in that position, an error message is generated stating "Scanned *side* bar code: *scanned bar code* does not agree with expected: *expected bar code* for plate at *location*."


Bar code confirmation
Scanned south-side bar code: MP0M7 does not agree with expected: SD0001.00-05 for plate at VStack01
OK
Please enter the correct bar code:
SD0001.00-05

Recovering from bar code errors

To recover from a bar code error:

1. Enter the correct bar code in the text box of the **Bar code confirmation** dialog box.
2. Click **OK**.

   The run continues.

Related information

For information about...	See...
Resolving errors in VCode bar code readers	*VCode User Guide*
Specifying bar-coded sides for incoming plates	"Setting up a plate icon" on page 164

Resolving plate inventory problems

About this topic

This topic describes how to check and test the Windows Open Database connection that is used by the VWorks inventory management system.

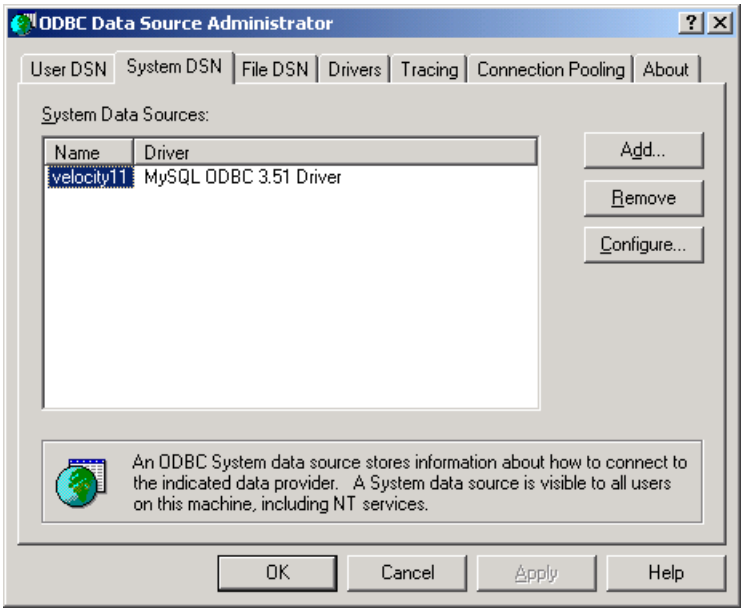
Checking the database settings

The inventory management database uses a Windows Open Database Connectivity (ODBC) interface. If you encounter inventory management problems, you may need to check the database settings.

To check the database settings:

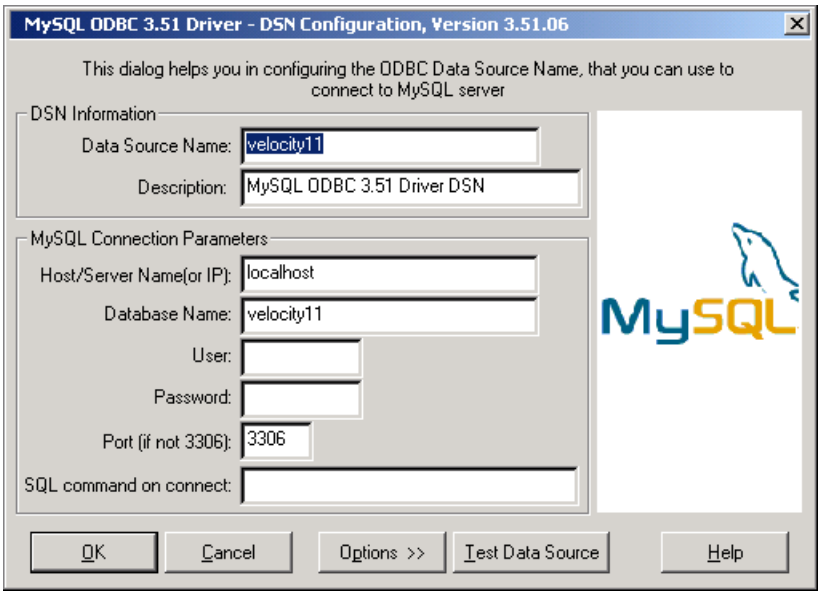
1. In Windows, navigate to **Start > Settings > Control Panel > Administrative Tools > Data Sources (ODBC)**.

   The **ODBC Data Sources Administrator** dialog box opens.



2. Click the **System DSN** tab.
3. Click **Configure**.

   The **MySQL ODBC *version* Driver** dialog box opens showing the database settings.



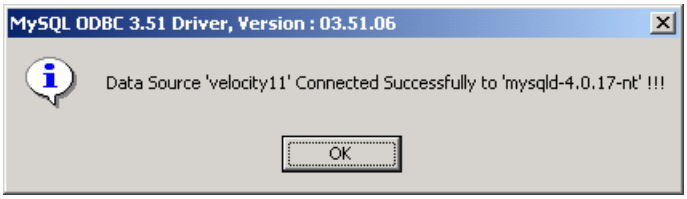
The **Data Source Name** and **Database Name** fields must both contain “velocity11”.

Testing the connection

To test the database connection:

1. Follow the procedure in “Checking the database settings” on page 524 to open the **MySQL ODBC *version* Driver** dialog box.
2. Click **Test Data Source**.

   A dialog box like the following example confirms a successful connection.



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Note: You can also use the online help to search for information. Download the latest version from www.velocity11.com/support/support.html.

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